DOCUMENT RESUME

ED 287 673 SE 048 627

AUTHOR Hornik, Frantisek, Ed.; Lipertova, Pavla, Ed.
TITLE Didactics of Biology. Selected Bibliography for 1984. Information Bulletin.
INSTITUTION Charles Univ., Prague (Czechoslovakia). Central Library.
PUB DATE 87
NOTE 370p.; For a prior edition, see ED 264 144. Contains some faint/broken print.
AVAILABLE FROM Central Library, Sectional Information Centre of Pedagogical Faculty, Charles University, Prague, Czechoslovakia.
PUB TYPE Reference Materials - Bibliographies (131)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Biology; College Science; Geology; Higher Education; Instructional Materials; Science Activities; Science Curriculum; *Science Education; Science History; *Science Instruction; *Science Materials; Science Teachers; Secondary Education; Secondary School Science; Teacher Education; *Teaching Methods; Technology

ABSTRACT

Selected articles on various aspects of biology teaching published in 1984 have been annotated in this bibliography. Entries from 23 journals representing 10 countries are presented according to a topic area classification scheme listed in the table of contents. Countries represented include: Australia; Bulgaria; Czechoslovakia; Federal Republic of Germany; France; German Democratic Republic; Great Britain; Hungary; Italy; Poland; Soviet Union; and the United States. The general topic areas include: didactics of biology as a scientific discipline; history of biology; biology instruction abroad; teaching/educational objectives; biology teaching at general education schools; content of biology instruction; didactical principles in biology instruction; biology instructional media; organizational forms of biology instruction; planning biology instruction; outcomes of biology instruction; biology tests; and articles concerning scientific biology. Each entry (numbered according to a code in the table of contents) includes author, original title (and English translation when appropriate), complete journal reference, and English abstract. Entries do not necessarily reflect all the topic and sub-topic areas included in the table of contents. (RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

INFORMATION BULLETIN

THE DIDACTICS OF BIOLOGY

Selected Bibliography for 1984

ED287673

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CENTRAL LIBRARY – SECTIONAL INFORMATION CENTRE
OF PEDAGOGICAL FACULTY – CHARLES UNIVERSITY
PRAGUE 1987

BEST COPY AVAILABLE

INFORMATION BULLETIN

THE DIDACTICS OF BIOLOGY

Selected Bibliography for 1984

CENTRAL LIBRARY – SECTIONAL INFORMATION CENTRE
OF PEDAGOGICAL FACULTY – CHARLES UNIVERSITY
PRAGUE 1987

[illegible] 3

DIDACTICS OF BIOLOGY - 1984

TABLE OF CONTENTS

Page
List of excerpted journals XIV
Authors of annotations XV

Classification of entries

1. The didactics of biology as a scientific discipline 1
1.1 The subject-matter of the didactics of biology . . . .
1.2 Definitions and objectives . . . .
1.3 Significance of didactics for practical biology instruction . . . .
1.4 Relation to other sciences and place in system of sciences 1
1.5 Basic terms and scientific terminology . .
1.6 Scientific methods, main sources and organization of scientific research 2
1.7 Basic differences existing in biology instruction and the didactics of biology in capitalist and socialist societies . . . 2
1.8 Periodicals on the didactics of biology . .
1.9 Textbooks and printed lectures on the didactics of biology . . . .

2. The history of biology teaching and the didactics of biology 4
2.1 The history of biology teaching and didactics of biology in Czechoslovakia . . .
2.2 The history of biology teaching and the didactics of biology in Czarist Russia and the USSR . . . .

2.3 The history of biology teaching and the didactics of biology in the other socialist countries . . . .
2.4 The history of biology teaching and the didactics of biology in the foremost capitalist countries 5

3. Contemporary biology teaching and the didactics of biology abroad 5
3.1 Contemporary biology teaching and the didactics of biology in the foremost capitalist countries 8
3.2 Biology instruction and the didactics of biology in the developing countries 12

4. Educational and teaching objectives and the tasks of biology instruction 13

5. Biology teaching as a component of instruction at general education schools . . . .
5.2 Specific aspects of biology instruction at general education schools . . . .
5.3 Specific aspects of biology instruction at specialized schools ... .
5.4 Principles for adjusting biology instruction to general education schools . . . .
5.5 The position of biology in the curriculum of general education schools . . . .
5.6 Special aspects of biology instruction at various levels of general education schools .
5.7 Mutual relations between biology instruction at various levels of general education schools . . . .

5.8 The educational and teaching significance of instruction in various biological fields, mutual relations between various biological fields, determining the sequence of individual biological fields of study . . . . . .
5.9 Elective biology instruction in general education schools 19

6. The educational and teaching process of biology instruction . . . .
6.1 The forming of biological notions and learning terminology 23
6.2 Acquainting pupils with biological laws . . 25
6.3 Acquainting pupils with the use of biological knowledge in practice . . . .
6.4 Teaching pupils basic scientific methods used in biology and acquainting them with school biology technical media . . . . . .
6.5 The forming of habits and skills and developing abilities 26
6.51 The forming of hygenic habits . . . .
6.6 The use of learnt knowledge, skills and habits in practice . . . .
6.61 Combining biology teaching and socially beneficial work . . . .
6.7 Guiding pupils towards successful learning methods in biology. The activation of pupils. Interests of pupils . . 27
6.71 Determining the causes of pupil failure in biology and in the use of logical procedures . . . .
6.72 The education of logical thinking in biology instruction 32

6.73 Developing language skills in biology instruction . . . .
6.74 Logical models in biology instruction, cybernetical models in biology instruction 36
6.8 Scientific education in biology instruction 39
6.81 The forming of a scientific worldview during biology instruction 41
6.811 Moral education 49
6.82 Atheistic education in biology instruction
6.83 Education towards socialist patriotism and proletarian internationalism in biology instruction . . . .
6.831 Education to peace 50
6.84 Work education in biology instruction. Education towards economizing 52
6.85 Polytechnical education in biology instruction 53
6.86 Aesthetical ecucation in biology instruction
6.87 Education towards nature conservation and environmental control in biology instruction 54
6.88 Health-care education in biology instruction 89
6.89 Sexology education in biology instruction 103
6.90 Educational and vocational guidance in biology instruction 106
6.91 Education towards parenthood in biology education 109
6.92 Education toward collectivism in biology teaching 110
6.93 Education towards defence training in biology instruction 110

7. The content of biology instruction 111
7.1 The principles for selecting teaching subject-matter, methods of this selection and the organization of teaching subject-matter . . 112

7.11 The integration of biology and other natural science subjects . . . .
7.12 Instruction on the basis of examples and categories . . . .
7.13 Problem teaching, project teaching 113
7.14 Team teaching . . . .
7.15 The historical method in biology teaching . 114
7.2 Selecting guiding principles of biology instruction and differentiating substantial and insubstantial teaching subject-matter, basic teaching subject-matter . . . .
7.3 Dividing teaching subject-matter into various classes and the principles of this division. The principles of ordering the subject-matter into a didactical system. Differentiation in biology teaching . . . .
7.4 Linear, concentrical and spiral ordering of teaching subject-matter . . . .
7.5 Dividing the subject-matter into chapters, topics and partial topics . . . .
7.6 Biology curricula and teaching syllabi . . 118
7.7 The study of existing curricula and teaching syllabi for biology instruction 122
7.8 The comparative study of curricula in the socialist countries and the foremost capitalist countries, positive and negative aspects of these curricula . . . .
7.9 Endeavours for modernization in biology instruction 123

8. Didactical principles in biology instruction .
8.1 The didactical principle of scientific approach 124

8.2 The didactical principle of combining school work with every-day life. The regional and current principle 124
8.3 The didactical principle of educational instruction 126
8.4 The didactical principle of a systematic and a consecutive approach . . . .
8.5 The didactical principle of unity of the specific and the abstract
8.6 The didactical principle of combining theory and practice 127
8.61 The didactical principle of comprehensibility . . . .
8.62 The didactical principle of awareness of the knowledge learnt . . . .
8.63 The didactical principle of the permanency of the knowledge learnt . . . .
8.7 The didactical principle of taking into account the individuality of each pupil . . 129
8.8 The didactical principle of taking into account interdisciplinary relations . . . 133
8.9 The didactical principle of hygienic and safe biology instruction . . . .

9. Methods of biology instruction 138
9.1 The dependency of methods used in biology instruction on the scientific methods used in biology . . . .
9.2 Classification of methods used in biology instruction . . . .
9.3 Principles for selecting an instruction method and its correct use . . . .
9.4 The method of continuous exposition . . .

9.5 Interview method 138
9.6 Method of work with literature (textbook, syllabus, workbook, worksheet, atlas, key for determining flora and fauna) 139
9.7 Method of observation 140
9.8 Experimental method 161

10. Biology instruction media 186
10.1 Individual types of media, their importance..
10.11 Studying the didactical value of media used in biology instruction . . . .
10.12 Principles for providing schools with media for biology instruction . . . .
10.2 Original live objects 188
10.21 Original objects in the environment . . .
10.22 Original objects in an artificial environment . . . .
10.23 Living nature rooms or corners in schools
10.24 Aquariums, micro-aquariums, terrariums, aqua-terrariums 190
10.25 Insectariums . . . .
10.26 Breeding animals in schools, breeding facilities, collection of animals. Calendars for collecting faune 191
10.261 Zoological gardens 194
10.27 Cultivating plants, hydroponics 200
10.271 A school plot of land, botanical gardens, young natural scientist stations, school biology centres, school forestry areas, scientific trails 211
10.272 Exhibitions . . . .
10.273 Museums 218
10.3 Mounted and preserved original objects . .

10.31 Dismantled plants . . . .
10.32 Dry specimens of plants with shape intact .
10.33 Herbariums . . . .
10.34 Collections of seeds, cross-sections of woody species, branches with buds, samples of plant disease . . . .
10.35 Plant specimens mounted in fluids . . . . .
10.41 Dismantled animals . . . .
10.42 Dissections of animals 219
10.43 Skin specimens, taxidermal specimens . . .
10.44 Specimens embedded in resins . . . .
10.45 Osteological specimens, specimens of skin derivatives . . . .
10.47 Specimens of bird eggs and nests, bird feathers and pellets . . . .
10.48 Specimens of mollusc shells and conches . .
10.49 Animals mounted in fluids . . . .
10.51 Microscopy specimens of plants . . . .
10.52 Microscopy specimens of animals and those pertaining to human biology . . . .
10.53 Palaeontological plant material . . . .
10.54 Palaeontological animal material . . . . . .
10.6 Three-dimensional representation media . .
10.61 Models 220
10.62 Imprints and casts . . . .
10.7 Two-dimensional representative media . . .
10.71 Films (school films, popular science films, film cassettes, etc.) . . . .
10.72 Television and radio in school 225
10.73 Pictures, three dimensional pictures 229
10.731 Pictures attached to flannel sheets . . . .
10.732 Pictures attached to magnetic boards . . .
10.733 Foils and transparencies 232

10.74 Photographs, macro-photographs, micro-photographs, photo-herbariums . . . , 233
10.75 Slides and slide series, projected microscopical specimens 235
10.76 Sketches, floral diagrams and formula, model for copying 236
10.77 Tape-recordings of animal voices, animal voices on phonograph records . . . . . .
10.78 Postage stamps with biological subject-matter . . . .
10.79 Rubber stamps, prints, photograms . . .
10.80 Statistical tables, graphs, diagrams . .
10.81 Maps . . . .
10.82 School bulletin boards, clippings from the press and periodicals . . . .
10.83 Textbooks, methodological handbooks . . . 238
10.84 Teaching syllabi . . . .
10.85 Worksheets, workbooks, didactical tests, questionnairs, didactical cross-word puzzles, didactical games, etc. 242
10.86 Atlases, keys and punch cards to identify natural objects 248
10.87 Basic scientific literature, literature concerning the didactics of biology . . . 250
10.88 Popular science literature and periodicals 251
10.89 Pupils´ notes 251
10.9 Devices and instruments for biology instruction 252
10.91 Devices for cultivating micro-organism cultures . . . .
10.92 Devices and aids for experiments with natural objects 253

10.93 Chemicals and indicators for experiments with natural objects . . . .
10.94 Measurement instruments . . . .
10.95 Devices for making images and reproducing sound, film projectors, episcopes, epidiascopes, slide projectors, overhead projectors, tape recorders and decks, radio sets, phonographs, radio-phonographs, combined projection facilities, control panels, video-cassette players and recorders 254
10.96 Optical devices, magnifying glasses, mounted magnifiers, microscopes, electron microscopes, exposure meters, cameras, stereo microscopes 255
10.97 Areas devoted to instruction and storage of aids - biology workrooms, biology laboratories, biology storage rooms . . . 257
10.98 Mini-calculators, computers, micro-computers and teaching machines in biology instruction 259

11. Organizational forms of biology instruction 261
11.1 Survey of organizational forms, classification of organizational forms . . . . .
11.2 Teaching lesson . . . .
11.21 Laboratory work 262
11.22 Practical exercises in biology 264
11.23 Hobby clubs 266
11.24 Biology discussions . . . .
11.25 Activities in extracurricula educational facilities 268

11.26 Work in a living-nature room or corner . . .
11.27 Activities in groups to catch up with the class . . . .
11.28 Work on experimental school plots of land . 269
11.29 Individual consultations and tutorials . . .
11.31 Excursions, hiking camps, field work . . . 270
11.32 Socially beneficial work, voluntary work done by pupils 276
11.4 Biology Olympiads, biological competitions . 277
11.5 Publication of a school magazine, bulletin board, work on school albums . . . .
11.6 Individual independent homework 278
11.7 Work in biology hobby club . . . .
11.8 Field work and summer natural science activities, science trails 280
11.9 Television and radio universities . . . . . .
11.91 Cooperational forms of biology instruction .
11.92 Individual instruction 282
11.93 Instruction in pairs of pupils . . . .
11.94 Group instruction . . . .
11.95 Instruction in divisions . . . .

12. Planning biology instruction 283
12.1 Instructions for drawing up plans for biology instruction and individual topics .
12.2 Preparation of teachers for instruction, for teaching lessons and for other organizational forms of biology instruction, teaching strategies 284
12.21 Preparations for botany instruction . . . 285
12.22 Preparations for zoology instruction . . . 289
12.23 Preparations for instruction in human biology 295

12.24 Preparations for instruction in general biology, genetics, ecology, molecular biology, ethology, the history of biology . . 303

13. The outcome of biology instruction 308
13.1 Testing results achieved in biology instruction, repetitions, strengthening, systemization and structuralization of subject-matter, surveys of subject-matter . . 310
13.2 Assessment of results achieved in biology instruction 311
13.3 School-leaving examinations in biology . . . .
13.4 Outcome of biological competitions and creative work of young people in biology . . . 313
13.5 Examinations in biology . . . .

14. The biology teacher, outstanding biology teachers 314
14.1 Demands made of a biology teacher 315
14.2 Teacher training in normal, inservice and post-graduate study courses at pedagogical and natural science faculties 316
14.21 Practical training by students of pedagogical faculties . . . .
14.3 Public activities undertaken by teachers, work in district pedagogical societies, in regional pedagogical societies, biology supervisors, visits to class by supervisors 317
14.4 Doctoral work in the didactics of biology . .
14.5 Self-education of biology teachers . . . . .
14.6 Pedagogical readings 317
14.7 Meetings, conferences, congresses, specialized committees, seminars, meetings of specialists in the didactics of biology . . . 318

14.8 Vocational guidance and the biology teacher . .
14.9 Outstanding biology teachers, anniversaries, deaths 322

15. Articles with information on scientific biology 323
15.1 Botany 324
15.2 Zoology, ethology 328
15.3 Human biology 337
15.4 General biology, genetics, macromolecular biology, biochemistry, biophysics and bionics 339
15.4.1 Ecology 342
15.5 Medical sciences and health care 343
15.6 Agriculture and agro-technology 344
15.7 Agriculture and zoo-technology 345
15.7.1 Microbiology 346
15.8 Outstanding scientists, anniversaries, deaths, outstanding biology educators 347

16. Scientific articles on nature conservation and environmental control 349

17. Scientific articles on technology and economics in relation to biology and biotechnology . . . 351

List of Excerpted Journals

ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 1 -26	Czechoslovakia
A biológia tanítása, 23, 1984, No. 1-6	Hungary
Biologiya i khimiya, 27, 1984, No. 1-6	Bulgaria
Biologia w Szkole, 27, 1984, No. 1-6	Poland
Biologie-Géologie, 71, 1984, No. 1-4	France
Biologie in der Schule, 33, 1984, No.1-12	GDR
Biologiya v Shkole, 58, 1984, No.1-6	USSR
Der Biologieunterricht, 10, 1984, No.1-4	FRG
Der mathematische und naturwissenschaftliche Unterricht, 37, 1984, No.1-8	FRG
Journal of Biological Education, 18, 1984, No. 1 - 4	Great Britain
Komenský, 108, 1983-1984, No. 1- 10	Czechoslovakia
Krkonoše, 17, 1984, No. 1 - 12	Czechoslovakia
Naturwissenschaften im Unterricht - Biologie, 31, 1984, No. 1-12	FRG
Památky a příroda, 9, 1984, No. 1 -10	Czechoslovakia
Praxis der Naturwissenschaften - Biologie, 32, 1984, No. 1 - 12	FRG
Přírodní vědy ve škole, 35, 1983-1984	Czechoslovakia
Science Education, 68, 1984, No. 1-5	USA
Teaching Science, 2, 1984, No. 1-2	Great Britain
The American Biology Teacher, 46, 1984, No. 1-10	USA
The Science Teacher, 51, 1984, No.1-9	USA
The School Science Review, 65, 1984, No. 1 - 4	Great Britain
Učební pomůcky ve škole a osvětě, 23, 1983-1984, No. 1 - 10	Czechoslovakia
Věda a technika mládeži, 38, 1984, No.1 -26	Czechoslovakia

Authors of annotations

Ph Dr. Antonín Altmann
RNDr. František Horník
Jiřina Chlumská
RNDr. Ludmila Rošická

1. THE DIDACTICS OF BIOLOGY AS A SCIENTIFIC DISCIPLINE

1.4 Relation to other sciences and place in system of sciences

1. HOMOLA, J.:
Nauka a system dydaktyczny (Science and the didactical system)
Biologia w szkole, 37, 1984, No. 2, pp. 74-76.

The author discusses the relationship between science and the relevant teaching subject concieved as a didactical system. He especially discusses the transformation of the former into the latter. The article is a translation from Czech into Polish; the article was originally published in Czech in the journal Přírodní vědy ve škole, 34, 1982-1983, No. 4.

didactics of biology - biology - teaching subject - scientific system - Czechoslovakia. 147319.

1.6 Scientific methods, main sources and the organisation of scientific research

2. FAJKUS, B.:
Význam metodologie pro rozvoj oborových didaktik přírodních věd (The significance of methodology for the development of specialized didactics in the natural sciences)
Přírodní vědy ve škole, 35, 1983-1984, No. 5, pp. 162-165. Lit. 12,
2 figs.

The author explains basic terms and notions, such as methods and methodology. He points to various aspects of creating a methodology for specialized didactics of natural science subjects taught in school.

didactics of biology - methodology - science - didactics - natural sciences - Czechoslovakia.
147319.

1.8 Periodicals on the didactics of biology

3. ALTMANN, A.:
Biologie in der Schule
Přírodní vědy ve škole, 35, 1983-1984, No. 5, pp. 172-173.

The author provides information on the 31st volume of the journal Biologie in der Schule which specializes in the didactics of biology and is published in the German Democratic Republic. The author provides a survey of the most important articles published in the journal and assess the contribution they offer to biology teachers in their preparation for class work.

didactics of biology - periodical - GDR - 147323.

4. LATMANN, A.:
Biologija v škole (Biologiya v shkole)
Přírodní vědy ve škole, 35, 1983-1984, No. 5, pp. 293-294.

Information on the 56th volume of the journal Biologiya v shkole, which is published in the USSR and specializes in the didactics of biology. The author provides a survey of the most interesting articles and assesses what the journal has to offer Soviet, as well as Czech and Slovak biology teachers.

didactics of biology - journal - USSR - Czechoslovakia. 147323.

5. STAWIŃSKI, W.:
Czasopismo "Biologieunterricht" i inne czasopisma predmietowe dla nauczycieli biologii (The journal Der Biologieunterricht and other specialized journals for biology teachers)
Biologia w szkole, 37, 1984, No. 3, pp. 185-188.

Information about the content of the journal Der Biologieunterricht published in the Federal Republic of Germany, which has been published since 1976 as a quarterly, with four issues annually. Specialists from all biology disciplines are members of the editorial board, as well as specialists in the didactics of biology.

didactics of biology - journal - FRG - Poland. 147323.

2. THE HISTORY OF BIOLOGY TEACHING AND THE DIDACTICS OF BIOLOGY

6. SUCKER, U.:

Kalenderium zur Biologiegeschichte 1984 (A calendar pertaining to the history of biology for 1984) Biologie in der Unterricht, 33, 1984, No. 1, pp. 31-33.

In 1984 we shall commemorate the 100th anniversary of the death of J.G. Mendel, the 150th anniversary of the birth of A. Weismann, the 250th anniversary of the birth of C.F. Wolf, the 150th anniversary of the birth of E. Haeckel, the 100th anniversary of the birth of G.F. Mayerhof, the 125th anniversary of the birth of J. Loeb, the 25th anniversary of the death of O. Vogt, and the 100th anniversary of the birth of Hirszfeld. Also 125 years ago Charles Darwin published his work "On the Origins of the Species by Means of Natural Selection", 100 years ago W. Roux studied the eggs of amphibians, 75 years ago W. Johannsen introduced the term "gene", "genotype" and "phenotype", 15 years ago the first successful synthesis of a gene by Beckwith, Eron and Shapiro was accomplished.

biology - history - classwork - GDR. 147365.

2.4 The history of biology teaching and the didactics of biology in the foremost capitalist countries

7. LACOMBE, G.:
A propos de l´histoire de science (Concerning the history of science)
Biologie, Géologie, 71, 1984, No. 2, pp. 341-344.

In the upper classes of secondary school in France the history of the natural sciences is a special teaching subject. The author here acquaints readers with methodological handbooks for teachers on the subject and explains its importance for the whole school curriculum.

didactics of biology - history of biology - school curriculum - literature for teachers - France.
147365.

3. CONTEMPORARY BIOLOGY TEACHING AND THE DIDACTICS OF BIOLOGY ABROAD

8. Glavnoe vnimaniye - prakticheskomu osushchestvleniyu reformi (The focus of attention should be devoted to the practical implementation of the school reform)
Biologiya v shkole, 58, 1984, No. 5, pp. 3-6.

Biology teachers should be among those who actively work for the current school reform. The authors of this editorial recommend discussions with pupils and conferences with parents concerning the content and purpose of the reform, which aims among others at making it possible to concentrate upon the most important basic knowledge in biology and to use suitable methods and organizational forms, which will lead to a better learning of the biological sciences and strengthening the ideological, political worldview and polytechnical education of pupils. Also classwork should, within the framework of the reform, become more effective.

didactics of biology - school reform - USSR. 147307.

9. IVANOV, Y.Y.:
Sovershenstvovat uchebno-vospitatelniy process
(Improving the teaching and educational process)
Biologiya v shkole, 58, 1984, No. 6, pp. 3-6.

An editorial which enumerates all the obligations and tasks of biology teachers during the first year of the school reform now being implemented in general education, as well as vocational schools. Also advice is given to teachers on how to improve the effectiveness of lessons and strive for the active participation of pupils in schoolwork. Among other aspects of a teacher's work which are stressed are worldview education, health care education, education towards parenthood (a new teaching subject is now being introduced into Soviet schools - the ethics and psychology of family life), as well as ecological education and education for peace.

didactics of biology - school reform - teachers - USSR. 147307.

10. Ministerstwo oświaty i wychowania, Instytut programów szkolnych: Program biologii z higiena dla klasy VIII
(The Ministry of Education and the Institute for School Curricula: The biology and hygiene syllabus for the VIIIth class)
Biologia w szkole, 37, 1984, No. 4, pp. 196-198.

A group of authors here describes the new biology and hygiene syllabus for the 8th class of basic school. In this class biology has 1 teaching lesson a week devoted to it. The main subject-matter includes ecology and environmental conservation, the evolution of organisms, the chemical composition of living organisms as proof of the unity of the world, the transformation of matter by plants and animals, regulation processes in plants and animals, contemporary biological sciences. The teaching of these topics is analysed in detail.

didactics of biology - school reform - new syllabi - basic school - 8th grade - Poland. 147307.

11. O prepodavanii biologii v 1984/85 uchebnom godu
(On biology instruction in the 1984/85 school year)
Biologia v shkole, 58, 1984, No. 4, pp. 22-27.

Methodological instructions prepared by the Institute of the Academy of Pedagogical Science of the USSR and recommended by the Ministry of Education of the USSR. They concern the main tasks of the new school reform and stress the training of pupils in various agricultural specializations, as well as health care, nature conservation and the forming of dialectical and materialistic worldview, knowledge of the nature of the region in which the school is found and hygiene education. Various methodological recommendations are provided, especially for increasing the activity of pupils in school and in homework.

didactics of biology - school reform - methodological instruction - Ministry of education - syllabi - USSR. 147307.

3.1 Contemporary biology teaching and the didactics of biology in the foremost capitalist countries

12. BEISENHERZ, P.C.:
The Second-Level Biology Course: An Endangered Species ?
The American Biology Teacher, 46, 1984, No. 2, pp. 102-105. Lit. 17.

The author analyses opportunities for selecting courses and specializations in the natural sciences at the second level of high school in the USA. Several types of courses have been created with various curriculums and with various syllabi which provide opportunities for better choices and better training.

didactics of biology - secondary school - biology - curriculum - syllabi - USA. 147307.

13. GAUDIN, F.A.:

Are Biology and Chemistry out of Order ?

The Science Teacher, 51, 1984, No. 2, pp. 29-31.
Lit. 9, 3 photos.

Students entering college are usually not sufficiently schooled in the natural sciences and have difficulties adjusting to scientific methods of work. Also it seems that biology is less popular than it was in the past because it is more difficult, it must now be studied in conjunction with chemistry and physics. Piaget's theory of learning should be applied to a greater extent to improve the quality of instruction. Original objects should be used to a greater extent.

didactics of biology - biology instruction - college - biochemistry - biophysics - USA. 147307.

14. MURPHY, P.J.:

A Cal-based Distance Education Project in Evolution. 1. Description of the project

Journal of Biological Education, 18, 1984, No. 1, pp. 37-44. Lit. 10, 16 tabs.

The author describes various alternatives for biology courses in the extra-mural (long distance) study of evolution. This course is based on the use of computers to simulate natural selection. In this article a genetic model is described, as well as the first two parts of the project; also a discussion has been added.

didactics of biology - biology instruction - college - evolution - natural selection - computer simulation - Great Britain. 147307.

15. PIERROT, F. - DEFER, F.:
Contribution à l´enseignement "du programme" de biologie en terminale A et terminale B (A contribution to teaching according to the biology teaching syllabus in the final class of general education secondary school in the "A" and "B" branches)
Biologie - Géologie, 71, 1984, No. 2, pp. 335-339.

The article describes the teaching syllabus for biology in the final year of secondary school.The following subject-matter is included: cellular theory, the development of life and evolution, evolution theory, the internal environment of an organism, hormonal regulation, the unity of organisms, immune reactions. In branch "A" digestion, the theory of stimulus transmission in the nervous system and an analysis of the behaviour of animals are also taught, while the "B" branch deals with the transmission of information in vertebrates, natural resources, the fossilisation of solar energy and biological equilibrium in the ecosystem.
In conclusion a recommended bibliotraphy for teachers is provided.

didactics of biology - biology instruction - general education - secondary school - general biology - teaching syllabus. 147307.

16. SHYMANSKY, J.:
BSCS PROGRAMS: Just How Effective Were They
The American Biology Teacher, 46, 1984, No. 1,
pp. 54-57, Lit. 9,
3 figs.

The author carries out an analysis of the BSCS biology programs used in the past 25years. He finds that among the BSCS programs for the natural sciences, the biology program has achieved the best results in all its versions. Students from urban environments and suburbs achieved the best results. A general science background has a positive effect on results achieved in biology. More experienced teachers (older ones) and those with higher academic degrees also achieve better results.

didactics of biology - biolody instruction - secondary school - teaching program - USA. 147307.

17. WARREN, G.:
Advanced Placement Biology as a Beginner Course
The American Biology Teacher, 46, 1984, No. 2,
pp. 109-112. Lit. 14,
1 tab., 2 figs.

The author described an advanced biology course which runs for two years on the basis of a syllabus from the National Committee for the Education and Development of Talented Students. On the basis of the experience with this syllabus duaing a five year period it was found that better results are achieved than in the normal three year biology course.

The author briefly describes the syllabus, the textbooks it uses and the forms of work based on it.

didactics of biology - biology instruction - syllabus - modernisation - USA. 147307.

3.2 Biology instruction and the didactics of biology in the developing countries

18. KNAMILLER, G.W.:
Linking school biology and community in developing countries
Journal of Biological Education, 18, 1984, No. 1, pp. 77-81. Lit. 6, 3 figs.

Biology teaching in the developing countries has an especially important role to play in the educational and learning process, since it can help explain the local conditions of the country and the current problems of society, such as the problem of nutrition and food supplies, water, fuel and health care. The author discusses various approaches to studying biology, and cites specific examples of modern biology instruction in the developing countries.

didactics of biology - biology instruction - developing countries - United Kingdom. 147307.

4. EDUCATIONAL AND TEACHING OBJECTIVES AND THE TASKS OF BIOLOGY INSTRUCTION

19. BARSOW, P. - MÜLLER, A. - WINDELBAND, A.:
Entwicklung von Interessen für Wissenschaft, Technik und Produktion schon in Klasse 5 (Teil II)
(The development of an interest in science, technology and production already in the 5th class-part 2)
Biologie in der Schule, 33, 1984, No. 5, pp. 166-168.

The authors continue in an article published in issue No. 2-3, 1984 and cite further suggestions on methods for developing in pupils an interest in various problems connected with science and technology. On the basis of the example of the topics "Conditions for the germination and nutrition of the Kidney bean" and "The Poaceae family" they define teaching and educational objectives, the development of problem situations, and suggestions for the course of the lesson.

didactics of biology - biology instruction - interest in science and technology - GDR. 147303.

20. KISILOWSKÁ, B.:
Wiedza biologiczna i jej przydatność w swietle badań
(Biological science and its usefulness in view of recent research)
Biologia w szkole, 36, 1984, No. 2, pp. 77-81.

One of the tasks of school is to acquaint pupils with the most important findings of new research and also to teach them to permanently acquire new knowledge in the future. The objective of modern teaching thus is to teach children to continuously learn, to develop their cognitive interests and to motivate them for further self-education. The author carried out a study on why pupils study biology and what its significance is for them and also how they assess the importance of biology for their own lives.

didactics of biology - biology instruction - learning - objectives - Poland. 147303.

21. **MASLOWSKI, O.:**
Postavení a úkoly biologie v nové československé výchovně vzdělávací soustavě (The status and tasks of biology in the new Czechoslovak teaching and educational system)
Přírodní vědy ve škole, 35, 1983-1984, No. 2, pp.42-52.

The Natural Sciences Faculty of the Palacký University in Olomouc held a seminar on March 4th,1983 on the status and tasks of biolgy in the new Czechoslovak educational and teaching system. The seminar was also held to commemorate the 10th anniversary of the death of prof. J. Šula and the 80th anniversary of the birth of prof. Mrkos, who died recently. The seminar was organised by the Departments of Biology for the Natural SciencesFaculty, the Pedagogical Faculty and the Medical Faculty, together with the Regional Pedagogical Institute in Olomouc. Among the papers presented were those which assessed the ecologization of biology teaching in various types of schools and 10 years of experimental courses in biology at various types of schools. Also guests from the GDR and Poland participated.

didactics of biology - biology instruction - modernization of teaching - new system of education - Czechoslovakia. 147303.

22. Ob oznakomlenii uchashchikhsya obshcheobrazovatelnik shkol s materialami dekaberskogo (1983 g.) plenuma CK KPSS (On acquainting pupils in general education schools with the documents of the December 1983 Plenary Session of the Central Committee of the Communist Party of the Soviet Union)
Biologiya v shkole, 58, 1984, No. 2, pp. 7-9.

The ministry of the USSR has sent to the Ministries of Education of the Union Republics a methodological letter about how to acquaint pupils in general education schools with the documents of the December 1983 plenary session of the CC of the CP of the Soviet Union. The letter recommends a special meeting for this purpose and combining the problems discussed at the Central Committee meeting with various science problems which pupils learn in school, as well as in extracurricula activities. Other aspects should be stressed in work education.

didactics of biology - biology instruction - communist education - general education school - USSR. 147303.

23. OCHENDUSZKO, J.:
Praktyczne zastosowanie taksonomiu celów
(Practical adaptation to a texonomy of objectives)
Biologia w szkole, 37, 1984, No. 4, pp. 239-247.
Lit. 27, 7 tabs.

The authors have compiled a taxonomy of cognitive objectives (knowledge and skills) and of educational objectives (interests, attitudes); in this article they demonstrate practical oppotunities for making use of these objectives in the teacher's work with the class. They then analyse the content of biology instruction in the 5th to 8th classes of basic school in relation to these teaching and educational objectives.

didactics of biology - biology instruction - taxonomy of teaching objectives - 5th to 8th class - Poland.
147303.

24. SENKEVICH, V.M.:
O printsipakh i usloviyakh ekologicheskogo obrazovaniya
(On the principles and conditions of ecological education)
Biologiya v shkole, 58, 1984, No. 1, pp. 75-77.

At present work is being carried on concerning the ecological education of young people. This education should include knowledge concerning the mutual relations between man, society, nature and the environment. The selection of various ecological problems for this education is of special importance. A special meeting of the Scientific Council of the Academy of Pedagogical Sciences was held in October

1983 in the city of Volgograd on the subject of the pedagogical ~~aspects of papers and~~ nature conservation. The proceedings of this conference have been published with the title "The pedagogical principles and conditions of ecological education".

didactics of biology - biology instruction - ecology - syllabus - conference - USSR. 147303.

25. Vpredi - bolshaya rabota (There is a great deal of work waiting for us)
Biologiya v shkole, 58, 1984, No. 2, pp. 3-7.

An editorial devoted to the tasks set by the October session of the Central Committee of the Communist Party of the Soviet Union for schools and biology teachers. The tasks of schools is to prepare youth for life under conditions in which they will live. Comprehensive measures taken for the reform of schools concern the further improvement of educational and teaching work, as well as an improvement of ideological and political education, moral education and other aspects.

didactics of biology - biology instruction - objectives of education - tasks of communist education - USSR. 147303.

26. ZVEREV, I.D.:

Puti sovershenstvovaniya biologicheskogo obrazovaniya
(Ways of improving the quality of biological
education)
Biologiya v shkole, 58, 1984, No. 1, pp. 3-6.

The teaching of the foundations of the biological sciences is subordinated to the general objectives and tasks of schooling and communist education. The teaching and educational process should lead to the ideological and political maturity of pupils and to a profound understanding of Soviet policy and the policy of the Communist Party. The experience of outstanding teachers indicates the possibility of gradually implementing all the set tasks, the organic combination of a lesson's content with the documents of the Party and Government, as well as with texts which acquaint pupils with the success of Soviet biological sciences and the national economy. Seminars and meeting with pupils should be organized, where older pupils prepare papers on various subjects, as well as meetings with workers or engineers from various factories or farms. The author also cites examples of using a selection of topics in different classes which aim at forming correct civic attitudes in pupils.

didactics of biology - biology instruction - modernization of teaching - communist education - USSR. 147303.

5.9 Elective biology instruction in general education schools

27. DISTLER, R.:
"Bau und Leistungen von Zellen, Geweben und Organen" - Erfahrungen und Vorschläge für den fakultativen Unterricht ("The structure and function of cells, tissues and organs" - experiences and suggestions for elective teaching courses)
Biologie in der Schule, 33, 1984, No. 10, pp. 372-376.

Elective courses are a suitable medium for differentiating pupils' interests. Group instruction is recommended as the most suitable form of teaching. This instruction can be homogenous, where all pupils do the same work in the same time, differentiated, where pupils do the same work, but on different objects, and heterogennous group work where pupils carry on different work on different objects. The author cites examples of when these forms can be used. He describes in detail two projects: The influence of temperature and light on the propagation of duckweeds and the propagation of duckweeds in distilled water and in a cultivating medium.

didactics of biology - biology instruction - elective courses - organizational forms - group instruction - GDR. 147313.

28. KRIENITZ, D. - KRIENITZ, L.:
Erfahrungen im fakultativen Kurs "Mikrobiologie"
(Experience with the teaching of an elective course on microbiology)
Biologie in der Schule, 33, 1984, No. 12, pp. 471-476.
4 figs.

The authors analyse the concept of an elective two-year course on microbiology and discuss its time schedule. Special attention is paid to the subject-matter chosen for the course - the qualitative study of phytoplankton, the quantitative study of phytoplankton and work with suspension cultures. Qualitative analysis requires the identification of various species of plankton, while quantitative analyses are carried out with the aid of a counting chamber. Work with suspension cultures aims at determining the amount of nutrients in a sample.

didactics of biology - biology instruction - elective courses - microbiology - plankton - GDR.
147313.

29. MANITZ, R.:
Erfahrungen zur Arbeit eines fakultativen Kurses "Sozialistixche Landskultur" - Anlage eines Baumkatasters (Experience with work in an elective course on "The socialist landscape" - Making lists of the trees in a landscape)
Biologie in der Schule, 33, 1984, No. 10, pp.370-371.

Within the framework of elective courses, the school where the author is a teacher was asked by the town of Kahl to make a list of all the trees in the town, which will then serve as the basis for caring, conserving and propagating greenery in the town. The author describes how she worked on this task, together with her pupils in an elective biology course. The pupils in this work developed their knowledge in biology, in the identification of plants, mounting techniques, documentation techniques, etc.

didactics of biology - biology instruction - elective courses - town greenery - trees - documentation - GDR. 147313.

30. PRÖSCH, C.:
Vorschlag zur methodischen Konzeption des fakultativen Kurses "Mikrobiologie" (The draft of a methodological concept for an elective course on microbiology)
Biologie in der Schule, 33, 1984, No. 6, pp. 229-234.

The author has been teaching an elective course on microbiology according to an outline provided by this journal in 1982. He now submits his experience. He concentrates on the topic Bacteria, to which 6 two-hour teaching lessons were devoted. For each two-lesson period the author describes the subject-matter taught, the focus of attention and adds comments on methodological aspects; independent activities of pupils predominated.

didactics of biology - biology instruction - elective courses - microbiology - GDR. 147313.

31. SCHIEFER, H.:

Erfahrungen zur Einführung der Schüler in den fakultativen Lehrgang "Bau und Leistungen von Zellen, Geweben und Organen", Teillehrgang 1 (Experience with introducing pupils to the elective course "The structure and function of cells, tissues and organs" - sub-section 1)

Biologie in der Schule, 33, 1984, No. 9, pp. 336-337.

In the school year 1983-1984 new syllabi for elective courses are being introduced into the curriculum of general education secondary schools; they differ from preceeding syllabi and this places new demands on biology teachers. On the basis of the example of the dissection of an earthworm, the mounting of a honey bee and the observation of permanent or native specimens of invertebrates, the author discusses methods for work used in elective biology courses.

didactics of biology - biology instruction - elective courses - GDR. 147313.

6.1 The forming of biological notions and learning terminology

32. BREHME, S. - DÖMHARDT, D. - LEPEL, W.D.:
Begriffe und Begriffesysteme in Biologieunterricht
(Notions and systems of notions in biology instruction)
Biologie in der Schule, 33, 1984, No. 6, pp. 224-229.
7 figs.

In successfully teaching notions in biology teaching the teacher should have a good grasp of the relation between the content of a notion and its scope, various assessments of characteristics, the relation between a notion and its visual or audial representation, the structure and development of definitions, etc. Also the formulation of various assignments should be based on knowledge of relations among various notions. The authors devote special attention to the subordination and superiority of various notions and various methods of their visual or audial representation.

didactics of biology - biology instruction - forming notions - terminology - GDR. 147313.

33. FRITZSCHE, G.:
Über die Bildung von Begriffen in der Biologie
(On the creation of biological notions)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 4, pp. 140-141.

In new scientific fields, new biological notions and terms must be created, which also eventually find their way into biology teaching. On the basis of the historical method the author demonstrates how new notions and terms were created in biology on the basis of new discoveries. He then discusses specific new scientific terms from general and molecular biology.

didactics of biology - biology instruction - forming terms and notions- historical method - FRG.
147313.

34. **METZKE, M.:**
Zur Bildung des Begriffs "Gärung`in Klasse 9
(On teaching the notion of fermentation in the 9th class)
Biologie in der Schule, 33, 1984, No. 9, pp. 334-335.
1 fig.

In explaining the term fermentation the author recommends using a drawing on the blackboard or a worksheet, which he describes in detail. The basis of this drawing or worksheet is the citing of various data in a table where alcohol fermentation, lactic fermentation and acetic acid fermentation are compared from the point of view of respiration, energy balance, final products,inputs and outputs. Filling in the table makes it possible for the pupil to create his own precise definition.

didactics of biology - biology instruction - creation of notions - terms - fermentation - GDR.
147313.

6.2 Acquainting pupils with biological laws

35. BRETSCHNEIDER, J.:
Biologische Theorie, theoretische Biologie und Biologieunterricht (Biological theory, theoretical biology and biology instruction)
Biologie in der Schule, 33, 1984, No. 4, pp. 124-129.

The task of biology is to provide pupils with empirical and theoretical knowledge about living nature. However, the place of theoretical knowledge should not be overestimated and in no case should empirical knowledge be overlooked in the course of teaching. The author first defines biological theory as a systematically ordered set of axioms on the subject-matter of biology. In biology instruction only some elements of this theory are taught and then they are gradually synthesized and extended. The author goes on to answer the question of whether theoretical biology exists, which theoretically deals with and assesses from a workview point of view the general and special theoretical findings of the biological sciences and which represents a unity of the theory of living organisms and the methodology of biology. Its founders are L. v. Bertanalaffy, E.S. Bauer, M. Hartmann and J. Schaxel. The theoretization of biology means that theoretical knowledge becomes the dominant content of biology and that its theoretical apparatus continues to be improved. The consequences of this theoretization can be summed up into several points: 1) Equilibrium should be sought between theory and empirical knowledge; 2) New knowledge should constantly be introduced into instruction; 3) Intradisciplinary and interdisciplinary relations should be implemented; 4) The practical implementation of theory should always be stressed; 5) Pupils should be acquainted with cognitive methods.

didactics of biology - biology instruction - theoretical biology - methodology - GDR. 147313.

6.5 The forming of habits and skills and developing abilities

36. CICHY, D.:
Normy wymagań dla uczniów klasy VIII (Requirement standards for pupils in the 8th class)
Biologia w szkole, 37, 1984, No. 4, pp. 199-201.

The author classifies various standards which have been created concerning the knowledge pupils in the 8th class should have. She cites a total of 39 requirements which pupils are expected to fulfill, which include knowledge of various definitions, notions, the ability to cite examples, explain relations, make simplifications, know the chemical composition of various organisms, the significance of specific phenomena, make interpretations, give descriptions and characteristics.

didactics of biology - biology instruction - basic school - 8th class - knowledge - standards - pupils - Poland. 147303.

6.7 Guiding pupils towards successful learning methods in biology. The activation of pupils. Interests of pupils

37- BARSOW, P. - MÜLLER, A. - WINDELBAND, A.:
Entwicklung von Interessen für Wissenschaft, Technik und Produktion schon in Klasse 5 (Teil 1)
(Developing an interest in science, technology and production already in the 5th class - Part I)
Biologie in der Schule, 33, 1984, No. 2-3, pp. 61-66.
4 figs.

The authors conceived this paper as a reaction to an open letter to all educators in the GDR which clearly formulated demands to develop pupils' interests in science, technology and production. They analyse how this requirement can be implemented in the subject--matter concerning fresh water fish, economically important sea fish, chicken eggs and the fertility of hens. For every example they cite educational and teaching objectives, the formulation of the problem, preliminary knowledge, how assignments should be given and the course of lessons. A number of quantitative data is cited for teachers.

didactics of biology - biology instruction - 5th class - fishes - polytechnical education - GDR.
147303.

38. FILIPCHUK, L.A.:
O roli prirody v formirovanii lichnosti (On the role of nature in the forming of a personality)
Biologiya v shkole, 58, 1984, No. 1, pp. 48-50.

The author selected 31 quotations from the educational writings of Sukholimski, which concern the educational influence which emotions can have on pupils. They contain the most important ideas of this outstanding educator, who stresses the role of the teacher in this context, the influence of nature on a person, perception, experience, intellect power and the need to teach pupils to love nature and to behave correctly outdoors.

didactics of biology - biology instruction - nature conservation - USSR. 137303.

39. HESSE, M.:
Empirische Untersuchungen zum Biologie-Interesse bei Schüllern der Sekundarstufe I. (Empirical studies to support pupil´s interests in the lower classes of secondary school)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 10, pp. 344-350. Lit. 15,
9 figs., 4 tabs.

The author describes a project which was carried out with 661 male pupils and 615 female pupils of the 5th to 9th classes in various types of general education secondary schools; the pupils received questionnairs which aimed at determining their interest in biology. Findings indicate that in the course of the lower classes of secondary school, an interest in biology tends to change. Pupils show a greater interest in subjects which concern cellular theory, evolution and ecology. Experiments with pupil observations were assessed in a positive manner, while demonstration experiments done by the teacher were assessed in a negative manner.

didactics of biology - biology instruction - interest of pupils - FRG. 147303.

40. KOPPRASCH, G.:
Reaktivierung von Wissen in Klasse 11
(The re-activation of knowledge in the 11th class)
Biologie in der Schule, 33, 1984, No. 5, pp. 178-180.

The teaching syllabus for biology in the 11th class of general education secondary school assumes that the pupils has a good command of knowledge learnt in basic school and also knowledge gained in other teaching subjects. The aim of this article is to point out various methods for re-activating this knowledge. The author documents his own approach to this problem on the basis of the example of taxonomy. He also cites various suggestions for assignments for pupils' independent work.

didactics of biology - biology instruction - repetition - general education secondary school - GDR. 147303.

41. OTTO, A.R.:
Möglichkeiten zur Förderung selbstgeregelten Lernens als Einführung in der Lernweise der gymnasialen Oberstufe. (Opportunities for furthering self-regulated learning in the upper classes of general education secondary school)
Praxis der Naturwissenschaften - Biologie, 33, 1985, No. 2, pp. 56-64, Lit. 7, 2 worksheets, 2 questionnaire, 1 fig.

The author describes the method of self-regulated learning, which he verified with his pupils from a general education secondary school during a week-long field trip outdoors. Autonomous, self--regulated learning is composed of two components: self-learning and independent assignments combined with their assessment.

didactics of biology - biology instruction
activation of pupils - independent work - field work - FRG. 147303.

42. TRAUTMANN, T.:
Schülerfragen als Ausdruck geistiger Aktivität
(Questions from pupils indicate their mental activity)
Biologie in der Schule, 33, 1984, No. 2-3, p. 95.

In the author's opinion, pupils should be supported in asking questions. He sums up his own experience in this area into five points: 1) Every questions should be answered. 2) Special questions should be answered during the intermission. 3) No question should be avoided. 4) A lesson should not turn into a question and answer session. 5) Clearly formulated questions contribute to developing pupils´ abilities to express themselves.

didactics of biology - biology instruction - pupil activity - questions - FRG. 147303.

43. VORZHEVA, L.A.:
Vospitatnie poznavatelnogo interesa k biologii sredstvami khudozhestvennogo slova (The education of pupils´ cognitive interests in biology through the recitation of poetry)
Biologiya v shkole, 58, 1984, No. 1, pp. 44-46.

A biology teacher should teach his pupils to love nature and have a correct attitude towards it. Suitable media should be chosen which make an impact upon a pupil´s emotions and these also include the recitation of poetry and the reading of prose out loud, especially when its subject-matter is nature and its beauties. The author describes his own experiences in this field and cites various poems or prose samples which can be used in biology lessons.

didactics of biology - biology instruction - activation of pupils - literature - recitation - USSR. 147303.

6.7.2 The education of logical thinking in biology instruction

44. **ALTMANN, A.:**
Srovnání ve výuce přírodopisu a biologie I.
(Making comparisons in the teaching of nature studies and biology - part I)
Přírodní vědy ve škole, 35, 1983-1984, No. 1, pp. 5-8.
5 figs.

The author discusses one of the logical procedures used in teaching both general science courses and biology - the making of comparisons. He stresses the importance of this method for the creation of notions and terms and for learning the systematics of flora and fauna. He also stresses the role which comparisons have in a number of biological scientific disciplines. This didactical tool leads to the increased activity of pupils, helps them to learn new terms and notions and thus improves and extends what they learn. Various examples of using comparisons in the teaching process are cited, both in the context of basic schools and general education secondary schools.

didactics of biology - biology instruction - logical procedures - comparisons - basic school - general education secondary school - Czechoslovakia. 147303.

45. ALTMANN, A.:

Srovnání ve výuce přírodopisu a biologie-část II
(Making comparisons in the teaching of nature studies and biology - part II)
Přírodní vědy ve škole, 35, 1983-1984, No. 3, pp.82-85.
2 figs., 3 tabs.

The continuation of an article about the use of logical procedures in the general science course and in biology. A number of practical examples are cited for the 6th class where in the general science course zoology is taught. A comparison between the domestic pig and wild boar or between the rabbit and the hare and between various orders of birds, arthropoda and insects can all be very fruitful. A table which sums up a comparison of the body structure of vertebrates and insects for use in general education secondary schools is attached.

didactics of biology - biology instruction - logical procedures - comparions - basic school - general education secondary school - Czechoslovakia. 147313.

46. LAZAROV, D.M.:

Izsledovatelskiyat podkhod i razvitiyeto na tvorcheskoto mislene i sposobnosti na uchenitsite
(A scientific approach, the development of creative thinking and the abilities of pupils)
Biologiya i khimiya, 27, 1984, No. 1, pp. 48-51.
Lit. 8.

A scientific approach to learning can be implemented above all in practical excercises, for instance in biology. The author cites the example of crop production. These excercises are 4 to 7 hours long and concern the amount, types and doses of artificiel fertilizers for specific types of plants, for instance for the cultivation of soya bean crops. Pupils are required to find supplementary literature on the subject, learn the outcome of practical experience and to decide for themselves optimum doses of fertilizer. The students also study the influence of specific elements, the influence of various physical factors on some plants, etc. They learn to compare the productivity of various plant strains and thus become acquainted with the work connected with crop production.

didactics of biology - biology instruction - pupil activity - logical thinking - crop production - Bulgaria. 147313.

47. MEHNERT, B.:
Einführung und Festigung des Vergleichens in Klasse 5
(Introductions and strengthening of comparisons in the 5th class)
Biologie in der Schule, 33, 1984, No. 1, pp. 25-26.

The first comparisons made in the fifth class concern living and non-living nature. This method is also used by the author in other topics, for instance when deriving the notion of amphibians. Comparison skills are also used in problem teaching, phich is here documented on the subject-matter of reptiles. In conclusion the author describes how she tests pupils´ abilities in making comparions.

didactics of biology - biology instruction - logical procedures - comparisons - 5th class - basic school - GDR. 147313.

48. SCHAEFER, G.:
Naturwissenschaftlicher Unterricht auf dem Wege von exklusiven zum inklusiven Denken (Instruction in the natural sciences is in transition from exclusive to inclusive thinking)
Praxis der Naturwissenschaften, - Biologie, 33, 1984, No. 9, pp. 288-290.
10 figs., 3 tabs., lit. 30.

The author confronts various polar methods of thinking,their advantages and drawbacks. A study indicates that pupils have problems with inclusive thinking. For this reason they should be educated in this direction, so that it can become a practical aid. The author cites examples to all three types of thinking: polar, exclusive and inclusive and cites practical situation in which each type can help.

didactics of biology - biology instruction - logical thinking - FRG. 147313.

49. SCHUBERT, F.:
Müssen sie den Fuchs in jeden Gewand erkennen ?
(Do they have to recognize a fox in any dress ?)
Biologie in der Schule, 33, 1984, No. 4, pp.135-138.
1 fig.

The quality of knowledge often depends upon the systematic repetition and systemization of the subject-

-matter taught. This is not only a question of refreshing knowledge, but also the exposition of new relationships and contexts. For instance pupils already know various facts about foxes, which can be extended by new, different aspects - for instance the fact that foxes are frequent carriers of rabies, etc. For this purpose problem situations are very useful. On the basis of his own practical experience the author cites examples of various problems and assignments given to pupils for this purpose.

didactics of biology - biology instruction - problem instruction - GDR. 147307.

6.7.4 Logical models in biology instruction, cybernetical models in biology instruction

50. HEINZ, M.R.:
Weisheit und Kybernetik (Wisdom and cybernetics)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 11, pp. 335-340.

The author attempts to explain the human problem of the meaning of life, to explain life on the basis of phylogeny and ontogeny and to clarify development on the basis of cybernetic models. He stresses the need to strive for equality and peace in human society. When cybernetic models are applied to the human situation it becomes clear that problems are never solved automatically, that human beings must always strive for their solution.

didactics of biology - biology instruction - cybernetic model - meaning of life - phylogeny - ontogeny - FRG. 147307.

51. MÖLTGEN, M. - MÖLRGEN, H.:
Modellökosystem Aquarium - ein quantitatives Langzeitenexperiment zur Ökologie (The model eco-system of an aquarium - a quantitative, long-term ecological experiment)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 7, pp. 212-215. Lit. 5.
2 figs., 1 master for copying.

An aquarium with a clearly defined cultivating medium can be used as an effective model of an eco-system. Among the phenomena which can be observed are succession of organisms and the food pyramid, on the basis of which an outline of the circulation of matter in the aquarium can be made. In un-aerated acquariums various fungi multiply more rapidly and the medium in the vessel soon begins to decompose, with various sulphur compounds developing. The author discusses the self-cleansing properties of the water, succession and the relationship between biotic and abiotic factors in an ecosystem. The experiment should be carried out in five aquariums; the author cites the precise composition of the cultivating medium and recommends that also physical and chemical aspects be observed, as well as biological ones.

didactics of biology - biology instruction - logical model - observations - eco-system - aquarium - FRG. 147313.

52. PETERSON, R.W.:
Great Expectations: Collaboration Between the Brain Sciences and Education
The American Biology Teacher, 46, 1984, No. 2,
pp. 74-80. Lit. 21, 1 photo.

Neurophysiology and biochemistry both strive to discover the neural mechanisms connected with learning and memory. New methods and instruments have been developed, which make it possible to study and simulate brain activity to a much greater extent than previously. Scientists have now created a new conceptual model of brain functions.

didactics of biology - biology instruction - neurophysiology - cybernetic models - biochemistry - USA.
147313.

53. REICHART, G.:
Perlenspiel und Computer-Simulation zum Hardy-Weinberg-Gesetz. Eine vergleichende Untersuchung
(A game with pearls and computer simulation in connection with the Hardy-Weinberg law - A comparative study)
Praxis der Naturwissenschaften - Biologie, 33, 1984,
No. 1, pp. 24-26.

A game with pearls was used in the course of computer simulation to demonstrate the division into different geno-types. The computer is an excellent medium for dealing with a large amount of data.
22 experimental persons carried out the simulation of the Hardy-Weinberg law of heredity and division of genotypes in the population. It was found that

19 persons in the group strongly preferred computer simulation to traditional teaching methods.

didactics of biology - biology instruction - genetics - population - computer simulation - Hardy-Weinberg law - FRG. 147313.

6.8 Scientific education in biology instruction

54. Ekonomicheskiy slovar (An Economic Glossary)
Biologiya v shkole, 58, 1984, No. 2, pp. 18-19.

In view of the tasks of polytechnical education and the need to acquaint pupils with the tasks of agricultural output and the economics of agriculture, teachers are provided here with a brief economic glossary, which concentrates on 8 entries on agricultural economics which biology teachers should know.

didactics of biology - biology instruction - economics of agriculture - glossary of terms - USSR. 147313.

55. Welche erzieherische Potenzen hat der Unterrichtsstoff ? (What are the educational potentialities of the school curriculum ?)
Biologie in der Schule, 33, 1984, No. 12, pp. 460-462.

The educational potentialities found in biology subject-matter are not absolute. In a specific historical situation they change and depend upon specific impulses. To actually implement them in the course of teaching, they must first be "mined" out of the teaching syllabus; this the author does on the basis of the example of the topic of active immunisation (its history, development, significance, present situation).

didactics of biology - biology instruction - science education - immunisation - GDR. 147313.

56. ZLATAROV, A.:
Prirodni nauki, priroden zakon, nauchna istina - "Priroda i nauka", God. VII (1936-1937) (The natural sciences, scientific truth and the laws of science. From the journal Nature and science (1936-1937) Biologiya i khimiya, 27, 1984, No. 2, pp. 29-30.

The author discusses the subject-matter of the natural sciences, the laws of science and the scientific truth as they appeared in the journal Priroda i nauka (Nature and science) in the pre-war period. In many ways the presentation of the subject-matter, as well as the subject-matter itself have greatly changed, but the journal nevertheless provides interesting reading.

didactics of biology - biology instruction - natural sciences - pre-war period - science journal - Bulgaria. 147313.

6.8.1 The forming of a scientific worldview during biology instruction

57. **ALEKSANDROVA, I.:**

Rolyata na integralniya podkhod za formirane na nauchen mirogled v obuchenieto po biologiya
(The role of an integrated approach to forming a scientific worldview in biology instruction)
Biologiya i khimiya, 27, 1984, No. 1, pp. 38-43.

The author recommends the elaboration of a plan for philosophical analysis of the subject-matter taught in biology which would reflect the philosophical approaches made in the context of a specific section of the teaching syllabus. Also specific subject-matter can be used to support philosophical ideas. This concerns not only biology but also other natural science topics and also the problem of which specific methods should be used to generalize biological knowledge and under what conditions a worldview synthesis of knowledge learnt can be carried out. The idea of using philosophical aspects in the teaching of various subjects is developed by the author on the basis of various examples.

didactics of biology - biology instruction - scientific worldview education - Bulgaria. 147313.

58. BENSER, G.:
Gründung der DDR - ein Wendepunkt in unserer Geschichte (The founding of the GDR - a turning point in our history)
Biologie in der Schule, 33, 1984, No. 5, pp. 161-166.

The author analyses the historical aspects of the founding of the GDR. First he provides a historical perspective and then he analyses the political aspects of the founding of the GDR, which led to a transition of power to the working class, the creation of a union between the working class and the peasants, a policy of peace and a stress on antifascism in foreign policy.

didactics of biology - biology instruction - scientific worldview education - history of the GDR - GDR. 147313.

59. CICHY, D.:
Kształtowanie naukowego światopogladu dzieci i młodziezy (The forming of a scientific worldview in children and youth)
Biologia w szkole, 36, 1984, No. 2, pp.120-121.

The author informs readers about a conference devoted to the education of a scientific worldview among children and young people, which was held November 25th to 26th 1983 in Warsaw and in which 260 scholars participated. The philosophical aspects of worldview education were discussed, as well as the role of the natural sciences in this education and the training of teachers at institutions of higher learning for this purpose. In the author's opinion this training has certain negative aspects. The conclusions of the conference are cited in detail.

didactics of biology - biology instruction - scientific worldview education - conference - Poland.
147313.

60. GOLLE, B.:
Vorschläge für die Erhöhung der weltanschaulichen Wirksamkeit des Biologieunterrichts (Suggestions for increasing the worldview effectiveness of biology instruction)
Biologie in der Schule, 33, 1984, No. 7/8, pp.280-287.

The staff of the Regional Padagogical Institute at Reise prepared a project for increasing the effectiveness of worldview education. The project concerns specifically the subjects taught in the 5th class, in the following topics: The accomodation of fish to life in the water;,the most important fish used as human food. For the 6th class the following topics are delat with: Pinaceae, the usefulness of insects, an introduction to microscopy. For the 7th class: bacteria. For each of these topics the educational and teaching objective is defined, the methods used to stress worldview aspects are described, questions and assignments for pupils are provided and a commentary for the lesson as a whole is given.

didactics of biology - biology instruction - worldview education - general education school - GDR. 147313.

61

61. GOLLE, B.:

Zum aktuellen Thema. Weltanschauliche Wirksamkeit im Biologieunterricht Klasse 8 - ein Vorschlag

(On a current topic. Suggestions for the more effective worldview education use of the biology teaching syllabus in the 8th class)

Biologie in der Schule, 33, 1984, No. 5, pp. 181-184.

The worldview education effectiveness of instruction depends on a number of factors which have a comprehensive influence on pupils. Among these factors are adequate learning of the basic subject-matter, an individualization of the educational potential of the subject-matter taught, providing opportunities for confrontations with practical life, the activation of pupils, the personality of the teacher, etc. On the basis of the example of the topic The development of an embryo and The hygiene of reproduction, the author provides suggestions for the worldview utilization of this subject-matter. Also selected aspects of social policy in the GDR should be stressed in this context.

didactics of biology - biology instruction - worldview education - 8th class - basic school - GDR.
147313.

62. HANKE, B.:
Über einen alltäglichen Beitrag zur weltanschaulichen Wirksamkeit des Biologieunterrichts (On every-day contributions to worldview education within the framework of biology instruction)
Biologie in der Schule, 33, 1984, No. 12, pp.462-464.

Visits to classrooms have shown that a number of problems exist in worldview education and that anthropomorphism is often found, as well as teleogical reasoning and biologism. One of the important daily tasks of biology instruction is to overcome these errors. The cited examples of anthropomorphism and teleology are arranged according to subject-matter taught in different classes.

didactics of biology - biology instruction - worldview education - anthropomorphism - teleology - GDR.
147313.

63. HEROLD, D.:
Erfahrungen und Vorschläge für die weltanschauliche Erziehung. (Experience and suggestions concerning worldview education)
Biologie in der Schule, 33, 1984, No. 4, pp. 133-135, 1 fig.

A full year´s experience with the new textbook for the 8th class indicated that textbooks are used much more frequently in class work than was previously the case. The new arrangement of the textbook also provides better opportunities for the more effective education of pupils. On the basis of the example of a teaching lesson devoted to the topic "Energy and mass metabolism in a cell, the author demonstrates how worldview education can be implemented in a much more effective manner. The author also makes use of the historical method and one which takes interdisciplinary relations into consideration.

didactics of biology - biology instruction - education towards scientific worldview - historical approach - interdisciplinary relations - textbook - 8th class - GDR. 147313.

64. HÖRZ, H.:

Bemerkungen zur weltanschaulichen Bildung und Erziehung im naturwissenschaftlichen Unterricht

(Comments on worldview education and teaching in the natural sciences)

Biologie in der Schule, 33, 1984, No. 2-3, pp. 49-54.

The author strives to introduce new aspects of educational problems; first he analyses the existing situation and the opportunities provided by educational work in schools and points out that young people are interested in worldview problems in the context of the natural and technical sciences. The author then goes on to discuss Marxist philosophy which provides answers to problems of the situation man faces in the world today, the meaning of life, its origins and the development of the world. In the author's opinion the main lines along which worldview problems should be explained concern man; the technical and natural science aspects represent a second line and structural and process thinking which leads to developmental thinking represents a third line; the mechanism of mental activities is the subject of a fourth line. In conclusion he discusses various aspects of worldview education.

didactics of biology - biology instruction - worldview education - GDR. 147313.

65. MÜLLER, G.:
Zu einigen weltanschaulich-ethischen Fragen der Schwangerschaftsunterbrechung (On some worldview and ethical problems of abortion)
Biologie in der Schule, 33, 1984, No. 4, pp. 150-154.

The purpose of this article is to help biology teachers in educating their pupils towards a correct attitude to the problem of abortion. First the legal aspects of the problem are discussed. In 1965 and 1972 the relevant laws were legislated. The problem has medical, social and ethical aspects and is closely related to the problem of individual responsibility. Another problem is whether life begins at conception or nidation or perhaps only after the 40th day of conception. On the other hand abnormal foetuses should not be allowed to continue their development. In conclusion the author cites several recommandations for teachers who will teach this subject-matter.

didactics of biology - biology instruction - sex education - ethical problems - abortion - GDR. 147313.

66. Prodovolstvennaya programa SSSR v deystvii (The implementation of the food program in the USSR)
Biologiya v shkole, 58, 1984, No. 2, pp. 16-18.

When acquainting pupils with various documents from meetings of the Central Committee of the Communist

Party of the Soviet Union and the Government of the USSR, attention should be given to the Food Program of the USSR. The article cites various data on crop production and farm animal breeding, the advantages of investments into the agro-industrial complex and the success achieved by work teams made up of pupils.

didactics of biology - biology instruction - worldview education -agriculture - food program - USSR. 147313.

67. ZINKER, W.:
Die weltanschauliche Bedeutung der naturwissenschaftlichen Erkenntnisse begreifbar machen (The worldview significance of knowledge concerning the natural sciences should be explained in a comprehensible manner)
Biologie in der Schule, 33, 1984, No. 11, pp. 423-424.

On the basis of the subject-matter dealt with in the topic "Charles Darwin the founder of evolution theory" the author attempts to explain, how on the basis of extensive knowledge it is possible to guide pupils towards worldview education. The author suggests that first pupils become motivated, on the basis of a talk by the teacher and then that they listen to a school radio program about Darwin's sailing on the Beagle; after this they are given assignments. In conclusion, pupils present papers concerning related topics dealt with in the previous lesson.

didactics of biology - biology instruction - evolution - Charles Darwin - worldview education - GDR. 147313.

8.1.1.1 Moral education

68. HEINZEL, I.:
Kenntnisse und Überzeugungsbildung - Ergebnisse einer Analyse (Knowledge and convictions as the outcome of an analysis)
Biologie in der Schule, 33, 1984, No. 11, pp.412-414.
1 tab.

The forming of convictions is a long-term and highly demanding process. Biology instruction provides a number of opportunities for bringing pupils to the conviction that the world is recognizable and that the utilization of scientific knowledge depends upon social conditions. This can be made more specific for instance in the 5th class with the topic "fish", where pupils arrive at their own conclusion that fish have adapted to life in a water environment. At this point, however, the notion of adaptation is not yet entirely clear for them.

didactics of biology - biology instruction - moral education - 5th class - basic school - fish - GDR.
147313.

6.8.3.1 Education to peace

69. BAEV, A.A. - BOUCHKOV, N.P.:
Yadrenata voyna shche postavi pod smem somnenie sashchestvuvaneto na choveka kato biologichen vid
(Nuclear war places the existence of man as a biological specie under doubt)
Biologiya i khimiya, 27, 1984, No. 1, pp. 1-8.

This article is a translation from the Russian and was originally published in the journal Priroda in 1983, No. 10. Mankind now faces a decision concerning its fate: whether it will go towards a general nuclear catastrophe or whether it will give up once and for all attempting to solve political and ideological conflicts through military action. The article describes the immediate effects of a nuclear attack, as well as subsequent consequences, which would lead to a genetic catastrophe and would threaten the very existence of mankind.

didactics of biology - biology instruction - education towards peace - atomic war - genetics - Bulgaria. 147313.

70. Kriegsgefahren - Argumente für den Biologielehrer
(The danger of war - arguments for the biology teacher)
Biologie in der Schule, 33, 1984, No. 7-8, p. 279.

The article first describes the damage done to nature in Vietnam by chemical warfare. Its negative aspects can be divided into four groups: 1) the use of herbacides and defoliating agents which completely

68

destroyed all vegetation, which then takes very long to renew; 2) the destruction of vegetation leads to the destruction of many animals and a decrease in the number of species; 3) in such areas the soil was badly damaged due to loss of nutrients and erosion; 4) rain water tends to flush out poisons from the soil into the rivers and coastal waters.

didactics of biology - biology instruction - education for peace - chemical warfare - Vietnam - GDR. 147313.

71. LOHS, K. - TRAPP, R. - KIASS, V.:
"Gelber Regen" - Hintergründe einer Verleudungskampagne ("Yellow Rain" - the background of a campaigne of slander)
Biologie in der Schule, 33, 1984, No. 11, pp. 408-412.

The findings of Chinese scientists in Nanking in 1977 concerning pollen analysis was of great interest to scientists all over the world. They concerned a phenomenon caused by honey bees, called "yellow rain". However, the Western tabloid press began to write that yellow rain was a new chemical weapon used by the Soviet Union in Afganistan and in southeast Asia. Western scientists have now shown that the yellow substance in question are honey bee excrements contamined by a fungus of the genus Fusarium. The so-called proof submitted by the Pentagon only serves to confirm that this was a campaigne of lies, which the US carried on against the USSR. The authors describe the phenomenon and convincingly show that the lies are indeed lies.

didactics of biology - biology instruction - education for peace, yellow rain - USSR. 147313.

72. POPP, M.:
Zum aktuellen Thema. Friedenserziehung - aktuell und lebensverbunden (On a current theme. Education for peace - in a timely way and in connection with every-day life)
Biologie in der Schule, 33, 1984, No. 2-3, pp. 83-84.

The new teaching syllabus for biology instruction in the 8th class makes it possible to carry out world-view education in an improved manner, in comparison to the previous syllabus. For instance the topic "Correct nutrition " can be given a strongly educational accent. A total of 7 educational and teaching objectives should be followed in class work. Educational aspects should be stressed when disscusing the number of those who suffer from hunger.

didactics of biology - biology instruction - 8th class - basic school - education for peace - world-view education - GDR. 147313.

6.8. 4 Work education in biology instruction. Education towards economizing

73. SAKHAROVSKAYA, G.A.:
Iz opita vospitaniya u shkolnikov berezhnogo otnosheniya k khlebu (Experiences with educating pupils towards an economizing attitude to bread)
Biologiya v shko,e 58, 1984, No. 3, pp. 32-33.

The author, who is teacher in a basic school in Irkutsk, describes her own experience with educating pupils towards economizing; this should be closely related to work education. Pupils form work team which help out in agriculture and also work on the school plot of land. The author cites the results of her educational strivings in the 6th class of basic school; she describes the topics she chose for the purpose, including selections from poetry, a description of life under the blockade of Leningrad during the war and about the Great Patriotic War.

didactics of biology - biology instruction - education towards economizing - work education - 6th class - USSR. 147313.

6.8.5 Polytechnical education in biology instruction

74. SHAKHMAZARYAN, P.S.:
Iz opita realizatsii printsipa politekhnizma pri obuchenii shkolnikov zoologii (Experience with the implementation of the polytechnical principle in teaching pupils zoology)
Biologiya v shkole, 58, 1984, No. 1, pp. 41-42.

One of the most significant educational and teaching tasks of biology teachers in basic and secondary school is leading their pupils towards learning a broad spectrum of polytechnical skills when learning biology. In this context, when teaching zoology, excursions to local farms are important, as well as acquainting pupils with farm animals, their species and strains and with those that are typical for the given region. The author describes a project when teaching the topic "Fish" in the 8th class in detail. He uses the biology of the trout, which is a typical fish for Lake Sevan in the Armenian SSR, as an example for this purpose. This subject-matter is divided into three teaching lessons and one excursion, which are described in detail.

didactics of biology - biology instruction - basic school - 8th class - zoology - fishes - polytechnical education - excursions - USSR. 147313.

6.8.7 Education towards nature conservation and environmental control in biology instruction

75. BARUŠ, V. - ZEJDA, J.:
Vydra říční a způsob její ochrany (The Eurasian otter and its conservation)
Památky a příroda, 9, 1984, No. 5, pp. 289-292.

The authors provide information about the numbers of extant Eurasian otters on rivers in Bohemia - in 1978 there were 171 of them. This is an increase in comparison to previous years and also the number of localities where the otters are found has increased. The outlooks for this predator are discussed and further measures are suggested for its conservation.

didactics of biology - biology instruction - nature conservation - mammals - predators - Czechoslovakia. 147313.

76. BARMEB, C.R.:
The World Campaign for the Biosphere
The American Biology Teacher, 46, 1984, No. 5, pp.268-271.
Lit. 11.

The author provides information on various activities undertaken by the organization Environmental Conservation located in Geneva, Switzerland, which concern the biosphere. Also the organization´s journal, Environmental Conservation, deals with various aspects of this problem. Among its activities are the International Year of the Biosphere, the International Decade of the Biosphere and The World Campaign for the Biosphere. The authors informs readers about the tasks of the organization and its concept of environmental conservation, its history since 1966, and also the role of teachers and pupils in nature and environmental conservation.

didactics of biology - biology instruction - environmental conservation - biosphere - international organization - biology teachers - USA. 147313.

77. BAUEROVÁ, Z.:
K ochraně našich netopýrů (Towards the conservation of our bats.)
Památky a příroda, 9, 1984, No. 4, pp. 240-242. Lit. 7, 6 photos.

The life of bats is adjusted to the changing seasons of the year and changes in climate which accompany them. These mammals have a very specific social structure and they live in different winter and summer homes in colonies. The author describes the

24 species found in this country. The pressures of civilization have led to decrease in their numbers.

didactics of biology - biology instruction - mammals - bats - nature conservation - Czechoslovakia. 147313.

78. CIBULKA, J.:
SOOS (The SOOS nature reserve)
ABC mladých techniků a přírodovědců, 28,1983-1984, No. 20, p. 20, 3 photos.

The SOOS nature reserve near the spa of Františkovy Lázně in Western Bohemia has remnants of very intensive volcanic activity and there are numerous mineral springs and small volcanoes in the vicinity, as well as other interesting geological phenomena, where interesting biological species grow, so that the locality is highly suitable for excursions which deal with geology, botany and zoology.

didactics of biology - biology instruction - nature conservation - nature reserve - excursions - Czechoslovakia. 147313.

79. CLAUSNITZER, H.J.:
Immer mehr Tiere und Pflanzen werden immer seltener
(Increasing numbers of plants and animals are increasingly rare)
Naturwissenschaften im Unterricht - Biologie, 32, 19U4, No. 12, pp. 444-449. 1 information sheet, 4 worksheets, 2 figs., lit. 24.

The number of extict species of plants and animals, or those that are threatened with extinction is constantly growing. The main cause of this fact is a destruction of the environment of these organisms. So-called "Red Books" have been introduced and various conservation programs started to reverse this development. Also biology instruction should contribute to conservation; pupils should contribute to conservation; pupils should not only learn which species are threatened, but also what measures can reverse the trend and what causes the threat.

didactics of biology - biology instruction - nature conservation - Red Book - FRG. 147313.

80. ČEŘOVSKÝ, J.:
Klíče od pralesa (The keys to a virgin forest)
Věda a technika mládeži, 38, 1984, No. 12, pp. 372-373.
3 photos.

The Šumava - Vimperk nature reservation also includes the Boubín virgin forest. The author describes a visit to this forest with the makers of a documentary film. To keep the virgin forest in tact it has become necessary to surround it with a fence to keep people and animals out. This area was declared a reservation already in 1856 and is thus one of the oldest nature reserves anywhere in the world and one of the oldest botanical laboratories outdoors. The area has 100 hectars. Because too many tourists visited the reserve, it was decided to build a nature and science trail around its circumference.

didactics of biology - biology instruction - nature conservation - nature reservation - excursion - science trail - Czechoslovakia. 147313.

81. ČEŘOVSKÝ, J.:
Kolik československých rostlin je na evropském "červeném seznamu" ? (How many Czechoslovak plants are on the European "red list" ?)
ABC mladých techniků a přírodovědců, 28,1983-1984, No. 23, p. 18.

The author provides interesting information on threatened plant species in Czechoslovakia. The European "red list" contains 83 species found in Czechoslovakia. This list has been revised and re-issued by the European Council in Strassburg, in 1983. Botanists from Czechoslovakia participated in its compilation.

didactics of biology - biology instruction - nature conservation - botany - threatened species - Czechoslovakia. 147313.

82. ČEŘOVSKÝ, J.:
Přesazovat či nepřesazovat. Problémy záchrany vzácných a ohrožených druhů (To replant or not to replant. Problems of rare and threatened plant species)
Věda a technika mládeži, 38, 1984, No. 8, pp. 244-245.

To replant is often the last legitimate opportunity to preserve a threatened plant specie. Replanting usually leades to a strengthening of the plant´s population and its reintroduction to its original site or to a new site. The author cites various rules for the correct and safe replanting of threatened species.

didactics of biology - biology instruction - nature conservation - botany - Czechoslovakia. 147313.

83. DRTIMOVÁ, Z.:
Ochranářský kalendář (A nature conservation calendar)
Přírodní vědy ve škole, 35, 1983-1984, No. 10, p. 369.

The Culture Department of the District National Committee (local government) in the town of Prachatice, together with its nature conservation activists, issues annually (since 1969) a so-called nature conservation calendar, which this year has been issued for the 14th time. It acquaints readers with nature conservation problems and recommends various practical measures for the Prachatice district. This is highly commendable regional work.

didactics of biology - biology instruction - regional aspects - nature conservation - Czechoslovakia. 147313.

84. EBENHARDT, E.:
25 let Krajského střediska státní památkové péče a ochrany přírody v Brně (25 years of work at the Regional Centre for the Conservation of Historical Monuments and Nature in Brno)
Památky a přírody, 9, 1984, No. 8, pp. 481-486.
13 photos.

In 1983 the Regional Centre for the Conservation of Historical Monuments and Nature in Brno celebrated the 25th anniversary of the beginning of its activities. The author provides a survey of these activities, in the South Moravian region, which has a large number of small, as well as large nature reserves and reservations, most of which were founded in the period 1960-1980. The author describes the most important ones and stresses the positive, as well as negative aspects of nature conservation activities.

didactics of biology - biology instruction - nature conservation - South Moravian region - Czechoslovakia - anniversary. 147313

85. FERTIKOV, V.I.:
Okhrana redkikh zhivotnikh, Krasnaya kniga RSFSR
(The conservation of rare animals. The Red Book of the Russian Soviet Federative Socialist Republic)
Biologiya v shkole, 58, 1984, No. 4, pp. 14-17.

Between the years 1600 and 1973 a total of 63 species and 55 subspecies of mammals and 94 species and 164 subspecies of birds have become extinct on Earth. Among the causes of this fact are evolutionary processes, the influence of man, hunting, changes in the entivonment, human economic activities, etc. The author comments on the anthropogenic factors in this list and the specific reasons why certain species of animals have become extinct. The author also comments on tourism as a factor which has a negative impact on nature, chemicals of various kinds used in agriculture and other changes in the ecosystem and their causes. The article also provides detailed information on the legal aspects of nature conservation in the USSR and the introduction of the Red Book for the Russian Federation in 1982.

didactics of biology - biology instruction - nature conservation - fauna - Red Book - USSR. 147313.

86. HAAFTEN, J.V.:
Seals in Danger
Teaching Science - Journal of the National School Science Society, 1, 1983, No. 1, p. 8.

Hunting seals in Europe has practically ceased. Their population has greatly decreased, because the pollution of the seas poses a threat to them. The author devotes special attention to the Mediterranean seal Monachus HERMANN, describes its last sites and also the measures taken to save this animal from extinction.

didactics of biology - biology instruction - nature conservation - fauna - Great Britain. 147313.

87. HALEŠ, J.:
Poznámky k ochraně našich plazů (Comments on the conservation of our reptiles)
Památky a příroda, 9, No. 8, 1984, pp. 491-494.
6 photos.

The author discusses the problem of reptile conservation in Czechoslovakia. The conservation of these animals deserves special attention, because reptiles continue to be killed by vandals. In school a correct attitude towards reptiles should be formed and pupils educated to help them to survive. The author provides a survey of the existing situation, the incidence of reptiles and measures which should be taken for their conservation.

didactics of biology - biology instruction - nature conservation - reptiles - threatened species - Czechoslovakia. 147313.

88. HESSE, M. - STASCHEIT-LANGER, H.:
Strassenbäume und Stresalz (Trees on streets and salting roads)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 12, pp. 434-443. Lit. 26, 3 figs. 5 worksheets, 3 tabs.

Many trees found in towns and cities are evidently damaged or already dead. The Federal Environmental Administration estimates that of the trees that annually are destroyed in towns and cities, 90 % are the victims of salting roads in the winter. He explains why trees in towns should be conserved at all costs. Pupils should be taught in biology lessons about the importance of greenery in an urban setting and what to do for its conservation. This topic is here designed for the 8th to 10th classes.

didactics of biology - biology instruction - nature conservation - urban greenery - FRG. 147313.

89. HEYDUK, A.:
Chráněná krajinná oblast Šumava (The Šumava nature reservation)
Věda a technika mládeži, 38, 1984, No. 3, pp. 84-85.

By a special decree dated December 12th, 1963 the Šumava nature reservation was created on 1630 hectars of land. It is the largest nature reservation in Czechoslovakia; its hills are formed by mica schist, granite and gneiss and predominantly covered with forests. The author also describes the flora and fauna of the Šumava hills and the work done there by nature conservationists. The number of otters found there has increased and the lynx has been successfully introduced into the area to help maintain the numbers of deer and roebuck at optimum levels.

didactics of biology - biology instruction - nature conservation - Šumava - nature reservation - Czechoslovakia. 147313.

90. HOMOLA, J.:
Vliv emisí na vegetaci (The influence of emissions on vegetation)
Přírodní vědy ve škole, 35, 1983-1984, No. 6, pp. 210-211. 1 tab.

The author describes the damage done by emissions and flyash, whose damage should be assessed together, because usually pollutants act in a combined form, not individually.

didactics of biology - biolody instruction - nature conservation - emissions - flora - Czechoslovakia. 147313.

91. JUNKOVÁ, E.:
Razvivane na poznavatelnite interesi na uchenitsite chrez obucheniyeto po biologiya v shesti klas
(Developing the cognitive interests of pupils through biology teaching in the 6th class)
Biologiya i khimiya, 27, 1984, No. 4, pp. 18-22.

For activating pupils in the 6th class biology course, when nature conservation is taught, extracurricula activities of various kinds are of special importance. The author discusses various forms of teaching and teaching methods suitable in this context; she also discusses hobby club activities which are connected with biology and nature conservation and finally she cites ten topics which are suitable for hobby club activities.

didactics of biology - biology instruction - nature conservation - hobby club activities - Bulgaria. 147313.

92. KHITSARA, B.N.:
Selskaya stanitsa yunikh naturalistov - baza opitnicheskoy raboti (Rural Young Scientist Stations - a basis for experimental work)
Biologiya v shkole, 58, 1984, No. 4, pp. 64-66.

The author describes his ten years of exprience in working in a rural Young Scientist Station, at the Dzhurdzulecki secondary school in the Moldavian SSR. The station has a special laboratory for viticulture, the cultivation of fruits and vegetables, animal breeding, nature conservation and environmental control.

didactics of biology - biology instruction - nature conservation - environmental control - hobby club activities - USSR. 147313.

93. HUSÁK, Š. - JATICKÁ, M.:
Chráněná území se slanomilnou vegetací na lokalitě Plácky (The Plácky nature reserve with salt-tolerant plants)
Památky a příroda, 9, 1984, No. 7, pp. 417-419.
Lit. 10, 1 tab., 1 map, 2 photos.

The authors describe a small nature reserve found in southern Moravia, near the village of Plácky. Previously there were 17 localities with salt-tolerant plants but only 3 have remained. The nature reserve, which is on one of them, has an area of 3.2 hectars and was established in 1950. The authors describe the history of the reservation, its present situation and also discusses its future. It is a place to which it is very suitable to bring school excursions on botany and ecology.

didactics of biology - biology instruction - botany - ecology - nature reservation - Czechoslovakia. 147313.

94. JORDAN, C. - HÖHLE, A.:
Sauer Regen und Waldsterben (Acid rain and the dying of the forests)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 11, pp. 360-367. Lit. 17, 2 materials for teachers, 7 figs., 1 worksheet

Symptoms of trees dying in the forest are simple and easy to identify on the basis of changes in the crown of the tree, its trunk and in the vicinity of its roots. The author describes these changes and possible measures to be taken for saving individual trees. For the purpose of school work, the topic is arranged into several lessons, which are completed by an excursion to the forest, where pupils carry out observations and experiments. They can also gather exhibits for showing to other pupils in school.

didactics of biology - biology instruction - nature conservation - environmental conservation - acid rain - forests - FRG. 147313.

83

95. JUNÁKOVÁ, M.:
Perspektivy ochrany fytogenfondu v CHKO Beskydy
(The outlooks for conserving the phyto gene pool
in the Beskyd landscape reservation)
Památky a příroda, 9, 1984, No. 10, pp. 617-619.
2 photos, 1 map.

The author describes the Beskyd landscape reservation and changes in the flora and fauna of the area - the number of species living there has decreased and there is less diversity than previously. Also the economic history of the area is described, the influence of extensive sheep breeding in the past, etc.

didactics of biology - biology instruction - nature conservation - landscape reservation - Czechoslovakia.
147313.

96. KUBCOVÁ, H.:
Krajina k životu (A landscape for living)
Věda a technika mládeži, 38, 1984, No. 17, pp. 532-533,
3 figs.

The author first cites a law on the protection of greenery (Decree No. 142/1980, Collection of Laws), issued by the Ministry of Culture of the Czech Socialist Republic and discusses some of its details, concerning for instance the conservation of trees which grow outside forest areas and under what circumstances they can be cut down. This Decree also creates the basis for activities carried out by culture sections of District National Committees (local governments). Data on the development of greenery are cited. The general education secondary school in Kladno carries on various activities in this area and the author recommends emulating them. These pupils have drawn maps of urban greenery and drafted plans for extending it.

didactics of biology - biology instruction - nature conservation - urban greenery - general education secondary schools - Czechoslovakia. 147313.

97. KUBÍNOVÁ, H.:
Mýtus o přemnožení dravců (The myth of too many birds of prey)
Věda a technika mládeži, 38, 1984, No. 6, pp. 180-181, 3 figs.

The Czech Nature Conservation League on January 14th 1984 carried out a census of buzzards living in this country. The author describes the organization of the census. The economic value of a single live Common buzzard has been estimated at 108.000 Cz. Crowns annually, in view of the food they consume - 70 % of which is the meadow mouse, an animal which consumes substantial shares of crops. There can never be too many buzzards, because their life and reproduction cycle is directly dependent on the amount of food they have - i.e. upon the number of mice.

didactics of biology - biology instruction - nature conservation - birds of prey - Czechoslovakia. 147313.

85

98. KUBÍNOVÁ, H.:
Ochranáři ve Vinoři. Jak využívají volný čas učni
(Nature conservationists in Vinoř. How apprentices make use of their leisure time)
Věda a technika mládeži, 38, 1984, No. 11, pp. 340-341. 3 photos.

Vinoř is on the northeastern outskirts of Prague; the town has a palace with a beautiful park, through which the Vinoř stream flows. The park also has a number of old rare trees and various other interesting flora and fauna, so that it has been made it into a nature reserve. A number of members of the Nature Conservation League and the staff of a gardening and park care enterprise care for the park, as well as students from a gardening secondary school.

didactics of biology - biology instruction - nature conservation - nature reserve - Czechoslovakia. 147313.

99. LAŇKA, V.:
Jak zachránit Venušin střevíček (How to save Venus´ slipper)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 20, pp. 6 - 7, 4 photos.

In spite of conservation measures set down in the law, the number of species in nature has decreased by 25 % since 1958. The author describes the situation of a flower with a poetic name: lady´s - slipper, whose Latin name, Cypripedium calceolus, means "slipper of Venus from Cyprus". Not only this specie, but also other members of the orchidaceas family are threatened, such as the bee orchid, helleborine and other orchids found in the temperate zone. The cause of the disappearance of these plants is the large-scale use of chemicals in agriculture, especially artificial fertilizers on large areas, the drainage of meadows and also acid rain.

didactics of biology - biology instruction - nature conservation - botany - Orchidaceae, - Czechoslovakia.
147313.

100. LETHMATE, J.:
"Walddiagnosen". Versuch einer Immisionsökologischen Analyse von Informationsmaterial der Energiewirtschaft
(A "diagnosis of the forest". An attempt to analyse immisions and the ecology on the basis of information provided by the energy sector of the economy)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 11, pp. 321-334. Lit. 21, 1 fig., 9 information sheets, glossary of specialized terms.

The energy producing sector of the economy publishes an increasing amount of information concerning air pollution by immissions; also the death of forests due to acid rain has been described in detail. The author carries out an analysis of this information. He shows that even if partial conclusions usually drawn from this material are correct, when taken together, the results are sometimes underestimated or even entirely wrong. Thus this information does not cite the accumulation of immisions in the environment and the cumulative effect of some substances.

didactics of biology - biology instruction - nature conservation - immissions - air pollution - acid rain - FRG.
147313.

101. LIENENBECKER, H.:
Schüler untersuchen die Bestanddichte von Mehlschwalben und Rauchschwalben (Pupils study the population density of House martins and swallows)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 12, pp. 401-405. 1 questionnaire, 2 photos, 1 information sheet.

The House martin and swallow are synanthropous birds, which pupils are well acquainted with. The article describes methods for filling in the attached questionnaire in conditions of small town; pupils in the 5th to 7th class can participate in observing the birds, within the framework of active work in nature conservation. These observations make it possible for them to become better acquainted with the birds and their life, behaviour and helps them to understand ecological and nature conservation problems and to consider measures which might be taken in this context.

didactics of biology - biology instruction - nature conservation - zoology - bird census - observations - FRG. 147313.

102. L'UDUCOVÁ, M.:
Výchova k ochrane přírody (Education towards nature conservation)
Komenský, 108, 1983-1984, No. 4, pp. 211-213.

On the basis of a study the author found that 55 % of her pupils usually spend Saturdays and Sundays with their parents outdoors and that 70 % of her pupils expressed an interest in learning more about nature. She therefore decided to devote more attention to problems of nature conservation and also to organize more outdoor excursions (autumn, winter, the importance of water and its economizing, meadows, etc.). She also recommends fiction for reading, gives her pupils quizzes, takes them to exhibitions which concern nature, etc.

didactics of biology - biology instruction - nature conservation - basic school - excursions - Czechoslovakia. 147313.

103. **MACHÁČKOVÁ**, J.:
Lesy budou žít (The forests will survive)
Věda a technika mládeži, 38, 1984, No. 8, pp. 228-229.
2 photos. 1 tab.

The author provides information about the campaigne called "April - month of forests" and also about activities organized by the Central Council of the Young Pioneer organization of the Socialist Union of Youth. This campaigne aims at helping to renew forests, as well as urban or village greenery. Its purpose is to activate pupils in this type of work, which is described in detail.

didactics of biology - biology instruction - nature conservation - forestry conservation - Young Pioneer Organization - urban greenery - Czechoslovakia. 147313.

104. MARTIŠKO, J.:
Jaro na Pálavě (Spring at Pálava)
ABC mladých techniků a přírodovědců, 28 1983-1984,
No. 15, pp. 14 - 15.

The Pavlovský hills in southern Moravia have rare types of plants and animals in a specific type of biota, called the Pavlovský steppe. Wild goats and mouflons can be found there, the former in large numbers which cause some difficulties, because they graze away all grass and cause soil erosion at some places.

didactics of biology - biology instruction - nature conservation - mammals - state nature reservation - zoology - Czechoslovakia. 147313.

105. MILES, P.:
Návrat krkavců (The return of the Common raven)
Krkonoše, 17, 1984, No. 6, p. 4.

The Common raven (Corvus corax) is the largest representative of songbirds and in recent years has again spread to places in Europe from which it had disappeared. Larger numbers of these birds have again populated Slovakia and from there have also come to the Jeseník mountains. From the north, i.e. from the GDR and Poland, these birds have also moved to the Krkonoše mountains in 1974 and since 1983 they have also come to the Jeseníky hills, where they nest. The raven can easily be distinguished from the rook, to which it is similar, because the raven has a wedge shaped tail.

didactics of biology - biology instruction - nature conservation - birds - songbirds - Czechoslovakia. 147313.

106. MILES, P.:

Proměny krkonošského ptactva (The variability of birds in the Krkonoše mountains)
Krkonoše, 17, 1984, No. 7, pp. 20-22. 6 photos.

Birds are a very good example of the variability of animals. They are one of the most vivid elements in the environment, they move about swiftly, over a large area and they usually will abandon an unsuitable environment and seek a better place. The birds of the Krkonoše mountains have been a subject of study since the 17th century when Gloger, Kablík, Friedrich and Schneider wrote about them. The author deals in detail with the changes which have occured in avifauna in recent years in this area.

didactics of biology - biology instruction - zoology - birds - nature conservation - Krkonoše mountains - Czechoslovakia. 147313.

107. MÜHLSTEIN, L.:

Čas ptačích snůšek (The time of bird egg laying)
Věda a technika mládeži, 38, 1984, No. 12, pp. 366-367, 1 photo, 2 appendixes.

The author provides instructions for the observation of birds in the spring, especially by pupils in the 6th class of basic school. Pupils can observe the arrival of birds, the acrobatic flight of bird of prey, the mating call of males, their mating behaviour, singing, territorial behaviour, building of nests, laying eggs, the clutch and care of the young. The article has an appendix of photographs, which shows the fragile beauty of bird nests.

didactics of biology - biology instruction - nature conservation - zoology - birds - observations - 6th class - Czechoslovakia. 147313.

108. MÜHLSTEIN, L.:
Když řeka zazpívala. (When the river sang)
Věda a technika mládeži, 38, 1984, No. 5, pp. 134-135, 4 photos.

The author describes the life of a clean and unspoilt river in the mountains and some of the birds he encountered there, such as the warbler, wagtail and dipper. The article is suitable as preparation for an outdoor excursion with pupils.

didactics of biology - biology instruction - zoology - nature conservation - mountains - birds - Czechoslovakia. 147313.

109. OBER, G.:
Schüler vergleichen Gärten unter dem Gesichtspunkt der Naturnähe (Pupils compare gardens on the basis of how close they are to nature)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 2, pp. 240-243. Lit. 14, 2 figs., 9 worksheets.

The author describes 5 small biotas which are all gardens and to various degrees approach conditions found in nature. By studying them, pupils are educated towards giving priority to natural gardens and towards rejecting gardens which are highly artificial, with exotic plants, etc. During an excursion pupils observe other gardens, compare them with the ones they learnt about and draw up a scale for the assessment of gardens. This also provides good training in botany. This topic requires one or two two-hour periods.

didactics of biology - biology instruction - nature conservation - botany - gardens - observations - excursions - FRG. 147313.

110. Ochrana mořských zdrojů (Conservation of marine recources)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 22, pp. 1 - 2. 2 appendixes, 1 photo, 1 pictorial table.

The need for conserving the seas and oceans has become imperative in recent years. Coastal waters have been extended, fishing is now subject to inspection and international agreements and in some seas the hunting of some animals has been completely prohibited. A number of countries are cooperating with the United Nations Food and Agriculture Organization which oversees projects for marine conservation. Some threatened species of fish and other animals should not be hunted at all, while others only at certain times of the year; for some fish quotas have been set for individual countries. Nevertheless, marine fauna continues to be endangered because the pollution of the seas is increasing.

didactics of biology - biology instruction - nature conservation - marine fauna - international agreements - Czechoslovakia. 147313.

111. PAAKSPUU, V.M. - SHERGALIN, E.J.:
Matsaluskiy gosudarstvenniy zapovednik (The Matsaluský national park)
Biologiya v shkole, 58, 1984, No. 5, pp. 15-18.

In 1971 in Ramsar in Iran an international agreement was concluded on the conservation of swamps which serve as nesting and wintering grounds for water fowl. On the basis of this convention there are 12 such sites in the Soviet Union, among them the Matsaluský national park (which received this status already in 1957), where there are extensive swamps which serve as nesting sites for birds. The authors describe its various biotas, how the bird population is regulated, the species of birds which nest there and the research done in the park in recent years.

didactics of biology - biology instruction - nature conservation - nature reserves - water fowl - nesting - USSR. 147313.

112. PAROČKA, K.:
Význam osobnosti učitele při výchově k ochraně přírody.
(The importance of the teacher´s personality in education towards nature conservation)
Komenský, 108, 1983-1984, No. 9, pp. 546-550.

In nature conservation education, the personality of the teacher is very important. The fundamental prerequisites for successful work in this area include not only extensive professional knowledge and methodological skills, but also positive character traits and a good relationship with pupils. The author discusses these problems on the basis of the example of the topic "Water" and the notions of clean and polluted water.

didactics of biology - biology instruction - nature conservation - basic school - relationship between pupils and teacher - Czechoslovakia. 147313.

113. PAUCKE, H.:
30 Jahre sozialistische Naturschutzgesetzgebung - Rückblick und Ausblick (30 years of socialist legislation on nature conservation - a retrospective and outlooks for the future)
Biologie in der Schule, 33, 1984, No. 7/8, pp. 273-278.

The author first discusses the general problem of laws concerning nature conservation. Already in 1831 the Prussian government attempted to implement measures for the conservation of nature, but encountered the large-scale resistence of industrialists. Decisive measures were taken in 1845, but nevertheless the results achieved were meger. Pettenkofer and Engels both point out the need to conserve nature. In 1877 the "International association against river, soil and air pollution" was founded. At the turn of the century the number of those speaking out for nature conservation increased, but nature and environmental conservation organized by the government did not begin before 1906. Socialist legislation dealing with this problem began in 1954 and continues, especially in laws enacted in 1970, when the law on the conservation of the landscape, which is still valid, was accepted.

didactics of biology - nature conservation - history - GDR. 147313.

114. PLOUSEK, J. - HOFMANN, G., BEYER, M.:
Zkušenosti ze záchranného chovu tetřeva hlušce (Tetrao utrogallus) v Krkonošském národním parku
(Experience with the breeding of the Capercaillie (Tetrao utrogallus) in the Krkonoše mountains national park)
Památky a příroda, 9, 1984, No. 2, pp. 100-104. Lit. 9, 2 photos, 3 tabs.

The purpose of experimental breeding of the Capercaille described in this article is its reintroduction into the environment of the Krkonoše moutains in the north of Bohemia. It was shown that these birds require care not only during nesting, but also in creating an environment they need. This subject-matter can be suitably used for example in biology instruction, especially in chapters on nature conservation.

didactics of biology - biology instruction - nature conservation - birds, national parks - Krkonoše - Czechoslovakia. 147313.

115. POKORNÝ, M.:
Zvířata na dálnici (Animals on the highway)
Věda a technika mládeži, 38, 1984, No. 7, pp. 212-213. 4 photos.

In recent years the number of small animals found in nature is decreasing because of the extensive use of chemicals in agriculture, the mechanisation of agriculture and also because of the development of transportation, especially road traffic. Annually thousands of rabbits, pheasants and also deer are killed on the highways of the country. Occasionally also foxes and wild boar are killed. The author cites data from various sources about the number of animals killed this way and also what can be done for prevention. The best methods is the building of wire fences or other barriers around highways, ultrasound signals sent off by cars and also optical preventive measures. This subject-matter is highly suitable for motivating pupils towards nature conservation.

didactics of biology - biology instruction - zoology - nature conservation - Czechoslovakia. 147313.

116. PŘÍHODA, A.:
Biologická kontrola vlivu průmyslových emisí
(The biological monitoring of the influence of industrial emissions)
Památky a příroda, 9, 1984, No. 10, pp. 614-616.
Lit. 5, 3 figs.

The author describes the immediate and also the secondary effects of industrial emissions upon forest tree species, soil and water in the northern areas of Bohemia and Moravia, which have led to the situation where on large areas it is impossible to cultivate fir and spruce, while the growth and development of other species is impaired. To renew the forest it is necessary to plant more hardy species such as beech and larch. The situation of the forests should be constantly monitored; the incidence of epiphytic lichens is an important biological monitor. The author specifically cites four different lichens who which can be used for this purpose. This method is highly suitable for biology hobby clubs and for activities of the chapters of the Czechoslovak Union of Nature Conservationists.

didactics of biology - biology instruction - hobby clubs - nature conservation - forests - emissions - pollution - Czechoslovakia. 147313.

117. RYDLO, J.:
Změny v rozšíření leknínů v okolí Velkého Oseka
(Changes in the dissemination of water lilies in the vicinity of Velký Osek)
Památky a příroda, 9, 1984, No. 7, pp. 434-436.
5 photos, 3 maps.

In recent decades we can observe a permanent decrease in the water lily population in Bohemia. The author describes various localities in the Elbe river basin and specifically the locality of Velký Osek where the water lily has all but disappeared from localities which have been left to themselves. There where the Union of Fisherman cares for various small ponds or water holes some water lilies can still be found. On the Elbe river itself they have also practically disappeared, due to the large-scale shipping which goes on there.

didactics of biology - biology instruction - botany - water lilies - waters - environmental pollution - Czechoslovakia. 147313.

118. SWITZER, T.G.:
When You´re Hot ....
The Science Teacher, 51, 1984, No. 6, pp. 58-61.
Lit. 6, 2 photos.

Waste chemicals can pollute waters, but they are not the only source of pollution. Also the fact that waste substances and discharged cooling water are usually warmer causes damage to water, since temperature is an important factor in the distribution and incidence of water organisms. When thermal pollution occurs, the number of organisms living in water decreases because the warm water leads to changes in the life cycle of organisms, specifically their reproduction, eggs, development metamorphosis, etc. On the other hand some organisms, specifically alges, grow much more rapidly in warm water. Thus alges proliferate and eutrophisation of waters occurs. Warmth also causes the inactivation of enzymes and causes the cellular membranes of plants to be more permeable to toxic substances. Thus to conserve the quality of waters, all discharged water should first be cooled. The author cites a number of experiments which pupils can carry out which concern the temperature of the water in relation to the life of aquatic organisms.

didactics of biology - biology - water - environmental conservation - water used for cooling - biology instruction - experiments - observations - USA. 147313.

119. TENDEL, J.:
Die Vernichtung des Waldökosystems (The destruction of the forest eco-system)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 11, pp. 353-360.

The article deals with various aspects of the current destruction of the forests as a whole, as a component of the biosphere. The extent of damage done to the forests of the northern hemisphere, in the industrialized countries, is described. This damage is, however, interrelated with the destruction of the tropical rain forest in the southern hemisphere. In discussing this subject-matter, pupils have the opportunity to learn about the responsibility man has for the destruction of the eco-system and the factors which are its causes.

didactics of biology - biology instruction - environmental conservation - forests - ecosystems - FRG. 147313.

120. UHLÍŘ, P.:
Problémy ochrany CHKO Orlické hory (Conservation problems in the Orlické mountains nature reservation)
Památky a přírody, 9, 1984, No. 10, pp. 620-624.
10 photos.

The Orlické hory nature reservation was created 15 years ago. It is made up of a total of 15 small reserves and 5 state reserves. The author describes these various areas, discusses the problem of agricultural output in the area, the situation in the forests and the amount of exhalations and emissions which pollute the area. Also various conservation measures implemented there recently are described.

didactics of biology - biology instruction - nature conservation - environmental conservation - nature reservations - Czechoslovakia. 147313.

121. VACEK, S. - JURÁSEK, A.:
Zvítězí buk nad imisemi ? (Will beeches become the victors of imissions ?)
Krkonoše, 17, 1984, No. 7, pp. 12-14.
7 figs.

The beech tree is fairly tolerant to imissions. At present it represents only 3 % of the trees found in the Krkonoše mountains, but it is assumed that in the future it will be planted more extensively. Since 1965 the Krkonoše mountains have received 490 kilo/ /tons annually of sulphur dioxide from an emission source 50 kilometers distant. The author deals in greater detail with the resistence of beeche trees to various imissions.

didactics of biology - biology instruction - nature conservation - imissions - Krkonoše mountains-forests - Czechoslovakia. 147313.

122. VANĚČEK, J.:
Silniční stromořadí - významná přírodní památka
(Trees along roads - an important natural and historical monument)
Památky a příroda, 9, 1984, No. 5, pp. 310-313.
4 photos.

A law decreed under Austria-Hungary, in 1837, set out the obligation to plant trees along roads. Now only remnants of these old lines of trees still exist, and they should be conserved. The most important trees planted in the past for these purposes include maples, linden, horse chestnuts and poplars;

at higher altitudes they include the sycamore maple, beech, birch and in mountains also the mountain ash and some varieties of birch. The author concentrates on describing the extant older lives of trees along roads.

didactics of biology - biology instruction - nature conservation - vegetations - roads- Czechoslovakia.
147313.

123. VLAŠÍN, M.:
Země, voda, obojživelníci (Soil, water, amphibians)
Památky a příroda, 9, 1984, No. 7, pp. 424-433.
Lit. 15,
15 photos

The author provides instructions for drawing up a socio-ecological index of our amphibians. The index describes the number, dissemination, ecology and anthropogenic influence upon each specie. Details are provided about each amphibian specie. This material can be used in the 6th class of general education secondary schools, when teaching zoology, as well as in hobby clubs.

didactics of biology - biology instruction - zoology - nature conservation - amphibians - Czechoslovakia.
147313.

124. VLČKA, J.:
Oběť třetihor (A victim of the Tertiary era)
ABC mladých techniků a přírodovědců, 28 1983-1984,
No. 8, p. 6,
2 photos.

The European hedgehog is threatened by the burning of old grass and leaves, by the proliferation of automobiles and also by modern agriculture. The author describes the biology of the hedgehog, its winter hibernation, pulmonary parasites which attack it and various activities which can be undertaken to conserve the hedgehog.

didactics of biology - biology instruction - zoology - nature conservation - insectivores - Czechoslovakia. 147313.

125. VYSLOUŽIL, J.:
Polské národní parky (National parks in Poland)
Památky a příroda, 9, 1984, No. 7, pp. 420-423.
4 photos, 1 map.

The author describes Polish national parks, their size, history and the flora and fauna found in them.

didactics of biology - biology - geography - nature conservation - national park - Poland - Czechoslovakia. 147313.

126. **WEBER, H.:**
Tempo 100 und bleifreies Benzin - die Rettung unserer Wälder ? (Will a speed limit of 100 and lead-free gasoline save our forests ? Naturwissenschaften im Unterricht - Biologie - 32, 1984, No. 11, pp. 379-390. Lit. 23, 1 information sheet, 2 figures, 3 worksheets, 5 tabs.

The author on the basis of diagrams discusses the contribution made by road transport to polluting the environment with dangerous substances. He explains the creation of substances which pollute the air in internal combustion engines. The most damaging are direct effects upon plants. Also measures which can be taken to decrease the amount of pollutants created are described. One such measure would be to set a 100 kilometer per hour speed limit on cars and to sell only gasoline which does not contain lead compounds. Also improving the design of engines which use other fuel systems would help. The author distinguishes long-term and short-term measures to be taken.

didactics of biology - biology instruction - environmental conservation - emissions - air pollution - road traffic - FRG. 147313.

127. **WEINITSCHKE, H.:**
35 Jahre Deutsche Demokratische Republik und Naturschutz (35 years of the GDR and nature conservation) Biologie in der Schule, 33, 1984, No. 7/8, pp. 268-273.

Already five years after the founding of the GDR the cornerstone of nature conservation legislation was laid with the law on the conservation and care of nature. During the following years the following tasks became most important: the creation and strengthening of a nature conservation organization, carrying out changes in the thinking of the public in the area of nature conservation, nature conservation work based on science, the development of adult education, education and teaching on nature conservation. The author then goes on to discuss various aspects of the 1954 law, experiences with its implementation and other laws in this area.

didactics of biology - biology instruction - nature conservation - GDR. 147313.

128. WERNER, A. - GERHARDT, A.:
Schutz der Baumbiotope (Conserving biotas at the edge of the forest)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 12, pp. 406-419. Lit.24,
2 questionnairs, 2 information sheets, 1 assessment sheet, 5 figs.

By now everybody knows about the damage that civilization is doing to nature - the mass media devote much attention to this subject. Certain species of flora and fauna are gradually disappearing from nature. The biotas found at the edges of the forest are among those threatened. The author describes these biotas and suggest acquainting pupils with them during school outdoor excursions; various material can be collected and then used as material for class work.

didactics of biology - biology instruction - nature conservation - environmental conservation - excursions - FRG. 147313.

129. CLAYTON, M.W.:
The Beginning of an Endangered Species Comeback:
The Peregrine Falcon
The American Biology Teacher, 46, 1984, No. 4,
pp. 212-220, Lit. 24,
8 photos, 2 tabs.

In the period 1960-1970 various measures were taken to limit the use of DDT which had a negative influence on nature. It was found that the negative effect of this substance, and ones similar to it, is especially strong for organisms at the top of the food pyramid, specifically birds of prey, including owls and also predators. In birds, chemicals cause damage to their egg shells, which become 15-18 % thinner. This has been called the pesticide disease of birds. Wherever these chemicals were used extensively, the numbers of these birds declined sharply. The author demonstrates these problems on the example of the Peregrine falcon, describes its numbers and the fluctuatation of its population in some countries. After the implementation of measures to limit the amount of DDT and other chemicals used in agriculture, the population of these birds is again increasing. There is now hope that the Peregrine falcon will be saved.

didactics of biology - biology instruction - nature conservation - birds - birds of prey - USA. 147313.

130. ZLATAROV, A.:
Lyubov k prirodata (A love of nature)
Biologiya i Khimiya, 27, 1984, No. 2, pp. 31-32.

Man had to develop a love of nature. At the beginning of his development nature was looked upon as an enemy, which had to be overcome by work, skills and hard thinking. Finally man has learned to utilise nature for his own good. But from conquering nature to loving it is still a long distance. Only when man begins to fully appreciate the laws of nature and to find in nature a source of wisdom for himself and his own improvement, can he begin to love and protect nature.

didactics of biology - biology instruction - nature conservation - Bulgaria. 147313.

6.88 Health-care education in biology instruction

131. BEAV, S.Y.:
Shkolniy vecher "Leninskie zaveti ob okhrane sdoroviya sovetskogo naroda (A school evening on the subject of the Leninst heritage on caring for the health of the Soviet people)
Biologiya v shkole, 58, 1984, No. 2, pp. 70-73.

This article will help teachers in dealing with problems of Soviet health-care which are part of the school curriculum, specifically in human biology and also in elective courses on human physiology. These problems can be dealt with at a school evening discussion about Lenin's heritage as far as the health care of the Soviet people is concerned. Pupils should be activated to a maximum degree when preparing the evening; they can prepare papers on the basis of recommended literature on the history and current situation in Soviet health care.

didactics of biology - biology instruction - human biology - hygiene - educative discussions - organizational forms - Leninist heritage - USSR. 147359.

132. **BÁNSKA**, K.:
Výchova proti škodlivým návykům (Education against bad habits)
Přírodní vědy ve škole, 35, 1983-1984, No. 7, pp.250-251.
Lit. 6.

The author, in the form of a pedagogical reading, deals with an important problem of health-care education. He specifically deals with drug abuse, toxicomania and their causes. Pharmacological, somatic and mental aspects of the problem are discussed, as well as factors connected with the environment; the article also discusses smoking, alcohol drinking, coffein, organic solvents and medicaments such as antipyretics and analgetics. Stress is placed on prevention.

didactics of biology - biology instruction - human biology - health-care education - toxicomania - Czechoslovakia. 147313.

133. BRAUNER, K.:
Ausser-Haus-Verpflegung ist ergänzungsbedürftig
(Eating away from home requires supplements)
Naturwissenschaften im Unterricht - Biologie. 32,
1984, No. 7, pp. 245-253.
2 information sheets, 4 worksheets

The author provides an outline for a two lesson unit on human biology, which is devoted to problems of correct nutrition, specifically when eating away from home and the consequences of the fact that most people work away from home has on nutrition. When eating away from home in a large catering establishment, the food usually contains too much fat and too little calcium. In 1983, 16.5 million people had at least one meal a day away from home. The author stresses the need to supplement fluctuations which occur in eating.

didactics of biology - biology instruction - human biology - nutrition - FRG. 147313.

134. BRAUNER, K.:
Wie man Mahlzeiten richtig einplant (How to correctly plan meals)
Naturwissenschaften im Unterricht - Biologie, 32,
1984, No.7, pp. 209-222. Lit. 6,
2 information sheets, 7 work sheets.

The article first defines correct nutrition and the daily requirements of various food components for boys and girls at the age of 14 and 15 years. Every pupils is then asked to compare the snack he or she have with them from home, with their real needs. The first two lessons are devoted to these problems. The third lesson is devoted to other factors of correct nutrition. In conclusion daily requirements of food and energy are discussed, what to eat for breakfast, the distribution of food during the day, the problem of animal and vegetable proteins and also the problem of vitamins and minerals in food.

didactics of biology - biology instruction - human biology - nutrition - FRG. 147313.

135. CORNER, T.R.:

Do Mouthwashes Really Kill Bacteria ?

The Science Teacher, 51, 1985, No. 6, pp. 34-40.
Lit. 12, 5 photos, 1 fig., 5 tabs.

Mouthwashes and also various desinfectants, such as detergents, can be used in class work and in project teaching. The author describes experiments with filtration paper with and without supposedly anti-bacterial substances. The preparation, execution and assessment of the experiment are described in detail. Also problems connected with the cultivation and demonstration of bacterial cultures are described in detail. E. coli bacteria are recommended as best for this purpose, but Staphylococcus epidermis, Bacillus megaterium, Bacillus subtilis and Bacilus cereus, as well as some strains of Streptococci are also suitable because they grow so quickly. Bacteria cultivation requires a steady temperature of 37 °C. The outcome of the various bacterial tests are described.

didactics of biology - biology instruction - human biology - hygiene - bacteria tests - bacteria cultivation - experiments - USA. 147313.

136. DEPPE, U.:
Schulverpflegung an einer Ganztagsschule (School meals in all-day schools)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 7, pp. 254-256. Lit. 5,
2 tabs.

The author provides various information about school meals in schools attached to sanatoriums, where pupils spend period of time for recovery after serious illness. The author discusses technical, organizational and also nutritional aspects of these meals and the distribution of correct nutritional values throughout the week.

didactics of biology - biology instruction - human biology - school meals - FRG. 147313.

137. HAENEL, H.:
Ernährung - Gesundheit und Ernährungserziehung
(Nutrition - health and education towards correct nutrition)
Biologie in der Schule, 35, 1984, No. 7-8. pp.309-316.
1 fig., 5 tabs.

Nutrition aims at satisfying the biological needs of man. It is closely connected with health. However, the share of various nutritional components in the diet still leaves much to be desired. For this reason the Central Institute for Nutrition has drawn up various recommendations for correct nutrition on the basis of which the menus offered by various institutions are created. The most important problem of nutrition in the GDR at present is overeating and the intake of superfluous substances, which leads to negative consequences from the point of view of health. This especially concerns dental carries, high blood pressure, and others. The author goes on to discuss simple rules which pupils should learn concerning correct nutrition for children and youth, as well as the correct rhythm of food intake and what should be avoided in nutrition. Special attention is devoted to ways of formulating rules of rational nutrition for children and youth.

didactics of biology - biology instruction - human biology - nutrition - health-care education - GDR.
147313.

138. HEYDEN, D.:
Gesundheitserziehung und Sportbiologie - dargestellt am Beispiel des Herz-Kreislauf-Systems (Ein unterrichtseinheit für die Klasse 10) (Health-care education and sports biology - on the basis of the example of the heart and circulation system (A teaching unit for the 10th class))
Praxis der Naturwissenschaften Unterricht - Biologie, 32.

This teaching unit is composed of three topics:
1) the heart, circulation system and sports;
2) the structure and function of the heart and blood

circulation; 3) heart and circulatory disease and their prevention.

Pupils are given specific assignments, such as to explain why people with regular sports training are capable of better body performance, etc. Other assignments concern various experiments with loading the heart during excercise, etc. Another includes civilizational disease and sports. In 1971 333 500 people in the FRG died of circulatory disease, which represents 45.6 % of total deaths. Such risk factors as smoking, high blood pressure, hyperlipemia, diabetes mellitus, and being overweight are all discussed, as well as the influence of old age, stress, lack of movement; arteriosclerosis and infarctus are also discussed.

didactics of biology - biology instruction - human biology - heart disease - circulatory disease - sports - observations - experiments - 10th class - FRG. 147313

139. HOFFMAN, M.:
Zum aktuellen Thema: Gewohnheiten und Erfahrungen der Schüler für die Gesundheitserziehung bewusst aufreifen (On a current topic: The purposeful creation of pupils'habits and experiences relevant to health care)
Biologie in der Schule, 33, 1984, No. 7-8, pp.299-300.

Then studying the biology teaching syllabi for the 2nd, 3rd and 4th classes the author found that many topics have a bearing on the health-care education of pupils. This should be made use of when teaching human biology in the 8th class. The author documents this on the basis of the example of the topic "Respiration". She analyses her own teaching procedures in various teaching lessons.

didactics of biology - biology instruction - health--care education - 8th class - GDR. 147313.

140. **MACHÁČKOVÁ, J.:**
Také kouříte ? (Do you smoke too ?)
Věda a technika mládeži, 38, 1984, No. 5, p. 131.

The author describes some of the results achieved in so-called Secondary School Specialized Activities, where pupils receive various prizes for their work in science, also among others from the Ministry of Health of the Slovak Socialist Republic. R. Švec, from a general education secondary school in Bratislava, received 6th place in a state wide competition, and a special prize from the Slovak ministry of Health. His research project dealt with the problem of smoking and the differences in the negative effects of different brands of cigarettes.

didactics of biology - biology instruction - secondary school - biology competition - smoking - Czechoslovakia. 147313.

141. **MACK, J.:**
Fleisch macht hungrig (Meat makes a person hungry)
Der mathematische und naturwissenschaftliche Unterricht, 32, 1984, No. 8, pp. 278-284. Lit. 12, 4 figs., 2 worksheets, 3 tabs.

The article deals with the problems which follow from the high consumption of meat in the industrialized countries; this fact is closely connected with the shortage of food in the developing countries, from which fodder for animals is exported. The increase in meat consumption is also closely connected with an increase of diseases which are caused by nutrition.Hence overeating in the industrialized countries is connected with undernourishment in the developing countries (i.e. a shortage of proteins). The author cites figures for per capita protein consumption in the western countries (annually 800 kg of proteins; of which 99.8 kg are meat, 300 eggs, 100 kg of potatoes, 100 kg of fruits). Every person eats a ton of meat before reaching 20 years of age. In conclusion pupils create workday and weekend menus which reflect the principles of correct nutrition.

didactics of biology - biology instruction - health care education - human biology - industrial countries - developing countries - protein consumption - FRG. 147313.

142. NAROSKA, V.:
Ist unsere Nahrung noch gesund (Is our food still healthy ?)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 7, pp. 223-244. Lit. 35, 7 information sheets, 10 figs., 3 worksheets, 2 statistical appendixes, 9 tabs.

The history of human food indicates that without preservation media and methods it is very difficult to store food. The oldest preservation methods included salting, pickeling in salt, smoking etc. All these methods continue to be used but besides them, new physical and chemical method are used which also preserve biological and taste components of food. The article discusses the use of chemical preservation media, as well as the use of artificial colouring agents. This subject-matter is presented in the form of teaching lessons for the 9th and 10th classes. A table on permissible colouring agents is attached. The unit requires 6 teaching lessons.

didactics of biology - biology instruction - human biology - 9th and 10th classes - food preservation - FRG. 147313.

143. OCHKUR, E.A.:
O dvigatelnom rezhime v systeme gigienicheskogo vospitaniya uchashchikhsya v nashey shkole (On the movement regimen within the system of hygiene education of pupils in our school)
Biologiya v shkole, 58, 1984, No. 3, pp. 24-27.

The recent reform of general education schools and vocational schools has changed the daily regimen of pupils. The author acquaints readers with the daily regimen of pupils in the Kazakh SSR and the experience of reachers in creating a system of hygiene and movement education which will lead to the founding of traditions to strive for the good physical and mental development of pupils. The principal of the school, as well as the school physician make an important contribution to this system. Activities include various forms of health-care movement and hygiene education, which aim at creating an optimum work regimen for pupils in school and in extracurricula activities.

didactics of biology - biology instruction - health-care education - secondary school - USSR. 147313.

144. PARLOW, S.:
35 Jahre Deutsche Demokratische Republik - 35 Jahre sozialistischer Gesundheits- und Sozialwesen
(35 years of the GDR - 35 years of socialist health-care and social welfare).
Biologie in der Schule, 33, 1984, No. 6, pp. 209-214.

The 35th anniversary of the founding of the GDR serves as an occasion to carry out an assessment of health care and social welfare policy.The author analyses statistics in these two areas and divides the period into the transition from capitalism to socialism (1945-1961), the period of the construction of socialism (1961-1970) and the period of the further development of socialism in the GDR (since 1970).

didactics of biology - biology instruction - health-care education - anniversary - GDR. 147313.

145. PFEIL, H.:
Die Bedeutung der Kartoffel (The significance of the potatoe)
Praxis der Naturwissenschaften - Biologie, 32, 1984, No. 8, pp. 285-286. Lit. 6, 4 tabs.

A brief article which contaisn a wealth of information about the substances found in potatoes and their importance for correct nutrition as one of man s basic foods. Several simple experiments are described which demonstrate the quantity and quality of strach in potatoes, their vitamin content, the nutritional value of 100 grams of potatoes, their mineral content, etc.

didactics of biology - biology instruction - human biology - health-care education - nutrition - experiments - FRG. 147313.

146. SCHMIDT, R.:
Zum aktuellen Thema. Eine Bedeutung Erziehungsaufgabe in Klasse 8 (On a current theme: an important educational task in the 8th class)
Biologie in der Schule, 33, 1984, No. 6, pp. 240-242.

The most important educational task of biology in the 8th class is to lead pupils towards a conviction that it is their personal, as well as societal interest to learn and maintain throughout life certain standards of hygiene. Teaching should not be limited only to the biological aspects of this problem, but should lead to the relevant ideological and ethical conclusions. The author demonstrates how this is practically done on the basis of the topic Respiration, where she devotes a great deal of attention to the problem of smoking. Also the making of a bulletin board on this subject is part of the class work.

didactics of biology - biology instruction - human biology - health-care education - smoking - GDR. 147313.

147. SIEVERS, D.:
Unnecessary Risks
The Science Teacher, 51, 1984, No. 6, pp. 29-33.
Lit. 11, 2 photos, 1 tab.

The author discusses safety and hygiene in biology teaching in secondary schools and colleges. He lists dangerous chemicals, which are used in class or laboratory work and also some hazardous experiments which are done and which require the use of protective glasses. During some experiments poisonous waste products are produced and must be done away with. The teacher is responsible for the health of his students and should know about these problems.

didactics of biology - biology instruction - hygiene - safety - class work - laboratory work - chemicals - USA. 147313.

148. VOROBYOV, B.I.:
Osnovi ratsionalnogo pitaniya (The foundations of rational nutrition)
Biologiya v shkole, 58, 1984, No. 1, pp. 6-16. Lit.4, 2 figs., 2 tabs.

The food program of the USSR deals with problems of improving the structure of nutrition until the year 1990. According to a decree of the Ministry of Education of the USSR, issued in 1984, various problems of rational nutrition should be included into the teaching syllabus in biology instruction. This article provides advice to teachers on how to deal with these problems and can be used for preparing instruction in the 8th and 10th classes.

didactics of biology - biology instruction - health-care education - nutrition - USSR. 147313.

149. WITTIG, B.:
Rauchgewohnheiten an einem Grossstadtgymnasium
(Problems of smoking among pupils in a general education secondary schools in large cities)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 7, pp. 216 - 221.
1 fig., 1 worksheet, 1 tab

The author discusses the findings of a recent project called "A Statistical Study of Smoking and an Assessment of Disease Related to Smoking Among Pupils in a General Education Secondary School in a Large City". For 1974 the statistics (for the FRG) cite 600 deaths resulting from drug abuse, 15 000 deaths as the result of traffic accidents and 140 000 as the consequence of smoking. In the USA 25 to 35 % of men and 5 to 10 % of women die of cancer which is directly related to smoking. Altogether this is a million Americans. The author also describes a very good questionnaire suitable for secondary school pupils, which concerns smoking.

didactics of biology - biology instruction - human biology - health case education - smoking - USA - FRG. 147313.

6.8.9 Sexology education in biology instruction

150. ESSER, H. - JANSEN, G. - GLOMBECK, G.: Dokumentation zur Pubertätsentwicklung. Sachinformation für Lehrer
(Documentation on puberty development)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 8, pp. 257 - 264. Lit. 8,
8 photos, 9 figs.

Factual information for teachers based on a study of 12 adolescents (7 boys and 5 girls) which concerned individual puberty development between the ages of 9 and 17; the material also includes photographs. Such documentation has never been published before. The authors compare puberty development in boys and girls and stress that each person develops in an individual and specific manner.

didactics of biology - biology instruction - development study - puberty - photo documentation - sex education - FHG. 147313.

151. PICKER, L.:
Human Sexuality Education: Implications for Biology Teaching
Journal of Biology Teaching, 46, 1984, No. 4, pp.92-98.
Lit. 75.

The author describes the history of sexology education within the framework of biology teaching in American schools. Even today there are various approaches to this problem, some educators are for and others against this type of education. From the point of view of biology teaching, teacher training is most important, teachers should be well prepared to teach this subject-matter. As traditional families are breaking down, the role of schools in sexology education increases. The number of cases of veneral diseases are increasing among young people, there is a great deal of confusion about sexual problems among young people and also the number of teen-age pregnancies is increasing. Schools must play their role and react to this development.

didactics of biology - biology instruction - human biology - sexology education - USA. 147313.

152. SÍBRT, F.:
Sexuální výchova a prevence pohlavních chorob v přírodopisu (Sexology education and the prevention of venereal disease in science education)
Přírodní vědy ve škole, 35, 1983-1984, No. 10, pp. 364-366. Lit. 9.

The author provides information and advice on topics in the teaching syllabus concerning sexology education and disease prevention for the 7th class. These topics are included into a chapter on contagious disease. Venereal disease in general should be discussed. Among the diseases mentioned are syphilis, gonorrhoea, trichomonas vaginalis and granuloma inguinale, as well as chancroid, which should be described. This topic is suitable for presentation by a physician in class.

didactics of biology - biology instruction - human biology - contagious disease - venereal disease - Czechoslovakia. 147313.

153. ST[illegible]CK, D.E.:

Answering Their Questions About Human Sexology
Journal of Biology. 46, 1964, No. 4, pp. [illegible]7 - [illegible]1.
Lit. 13
1 photo.

The author discusses problems of sexology education in American schools. Various facts concerning anatomy and physiology are taught in various sections of the course. The author discusses when it is best to discuss the problem of sex and related topics and describes various experiences with teaching this subject-matter. Teachers are not, however, always certain to what extent they should go into details and how much to explain. Only 30 % of parents interviewed in a recent study want their children to learn about sex in school. The authors present various views on this problem.

didactics of biology - biology instruction - sexology education - USA. 147313.

6.9 Educational and vocational guidance in biology instruction

154. **AZATKHONOVA, N.:**
Kak ya vospitayu interes k selskokhozyastvennim professiyam pri obuchenii biologii (How I educate pupils towards an interest in occupations in farming during biology teaching)
Biologiya v shkole, 58, 1984, No. 3, pp. 39-41.

The author describes her work with pupils in the mountains of the Tadzhik SSR; she provides vocational guidance and counselling with the aim of having her pupils choose a career in farming. She acquaints them with various aspects of farming and a description of various occupations in farming. She carries out this type of education both in mandatory and in elective courses.

didactics of biology - biology instruction - vocational guidance - farming - USSR. 147313.

155. **KOPANEVA, E.M.:**
Na povestke dnya - povisheniye kachestva trudovoy podgotovki selskikh shkolnikov (The order of the day: improving quality of work education of rural pupils)
Biologiya v shkole, 58, 1984, No. 6, pp. 58-62.

The author informs readers about an All-Union seminar on "Increasing the Efficiency of Work Education and the Vocational Guidance of Pupils in Rural Schools" which was held in June 1984 in the Kostroma region. She also informs readers about her own experience in this area of education.

didactics of biology - biology instruction - vocational guidance - career in farming - USSR. 147313.

156. MIKHALEV, I.P.:
Gotovyat veterinarov (The training of veterinary doctors)
Biologiya v shkole, 58, 1984, pp. 54-57.

The author provides information about the training of veterinary doctors at institutions of higher learning in the USSR. He describes in detail the curriculum offered by the Skryabin Veterinary Academy in Moscow. A survey provides a history of the most important epidemics among farm animals during the last thousand years and discusses existing individual diseases found among animals in the USSR, as well as the results achieved by modern veterinary science in combating these diseases.

didactics of biology - biology instruction - higher learning - veterinary medicine - vocational guidance - USSR. 147313.

157. ONOPRIENKO, J.N.:
Kak ya ispolzuyu kraevedecheskiy material v trudovom vospitanii i professionalnoy orientatsii shkolnikov
(How I make use of regional material in work education and the vocational guidance of pupils)
Biology v shkole, 58, 1984, No. 5, pp. 39-42.

The author describes the experience of teachers at a secondary school in Pavlodar in the Kazakh SSR with using regional specific information when carrying out the vocational guidance of pupils. Pupils become acquainted, within the framework of their class work, with local farms and with various plants and factories which are found in the town itself. Main stress is placed on the Food Program of the USSR and persuading pupils they should actively contribute to its fulfillment.

didactics of biology - biology instruction - vocational guidance - regional principles - Food Program - USSR. 147313.

158. YOUNG, S.P.:
Careers in the Biological Sciences - Finding Your Niche
The American Biology Teacher, 46, 1984, No. 1, pp. 12-17.

The author provides a survey of various occupations and jobs which graduates of the Lafayette College who had majored in biology now hold. She also describes their income. She provides statistics on this subject for the period 1977-1981.

didactics of biology - biology instruction - higher education - vocational guidance - jobs - income -USA. 147313.

6.91 Education towards parenthood in biology education

159. **LOTHER, I.:**
Zu weltanschaulich-ethischen Problemen der Familienplanung (On the worldview and ethical aspects of planed parenthood)
Biologie in der Schule, 33, 1984, No. 12, pp. 489-492.

12 years ago a law on abortion was legislated in the GDR, which has led to improving the equal social status of women. Since 1976 the positive influence of the law has been clearly apparent; since that year increases in fertility have been registered. Besides measures to improve the living standards of families with small children, also worldview and ethical aspects of the family have been stressed, which are connected with the socialist way of life and goals in life. In this context the author asseses very positively the work done by the journal Biologie in der Schule, but expresses critical disagreement with an article published in issue No. 4, in 1984.

Didactics of biology - biology instruction - human biology - planned parenthood - GDR. 147313.

6.92 Education towards collectivism in biology teaching

160. STEPANSKIY, V.O.:
Psikhologicheskie aspekti vospitaniya shkolnikov
(The psychological aspects of educating pupils)
Biologiya v shkole, 58, 1984, No. 5, pp. 25-30. Lit.15.

The author discusses problems with creating good team work and mutual relations among pupils in a class, as well as the positive aspects of personality education, relations between pupils and adults and developing pupils´ needs to participate in socially beneficial work. The author also acquaints readers with a study on interpersonal relations among pupils in the lower classes of basic school where normal and experimental classes were mutually compared.

didactics of biology - biology instruction - education towards collectivism - study of interpersonal relations - USSR. 147313.

6.93 Education towards defence training in biology instruction

161. ECKLEBEN, G.:
Zum aktuellen Thema. Beziehungen zwischen dem Biologieunterricht und dem Lehrgang Zivilverteidigung
(On a current topic: Relations between biology instruction and civilian defence)
Biologie in der Schule, 33, 1984, No. 2-3, pp. 85-87.

Pupils in basic school should, among other things, learn how to give first aid. On the basis of the example of the biology teaching syllabus for the 8th class, the author documents how it is possible to utilize the knowledge learnt in the topic "First Aid" when learning civilian defence in the 9th class. Biology provides pupils especially with theoretical knowledge, while in civilian defence they concentrate on practical training and learning various skills. The author also cites examples of various assignments which require a synthesis of knowledge and skills acquired in both teaching subjects.

didactics of biology - biology instruction - defence training - interdisciplinary relations - GDR. 147313.

7. The content of biology instruction

162. FENTON, E.: Bring Back Botany
Teaching Science - Journal of the School Natural Science Society, 2, 1984, No. 2, p. 2.

The author discusses the existing situation in biology teaching and the attitude of pupils towards biology or science courses. New fields of study, such as bio-chemistry or biophysics are often already a part of the curriculum. But zoology is still among the most popular courses, while botany continues to be among the least popular courses. This is because botany is not so attrective. Not even systematic botany is able to explain the evolution of plants in such a way which would be deemed interesting by students. It is, however, often overlooked that botany deals with the most important source of food, with plants. The author cites an interesting answer he received when he asked a student what he found most interesting in a biology course. The reply was: sex!

didactics of biology - biology instruction - botany - Great Britain - 147307.

7.1 The principles for selecting teaching subject-matter, methods of this selection and the organization of teaching subject-matter

163. HERMANN, E.:
Beispiele aus der Geschichte der Biologie für Problem- und Aufgabestellungen im Unterricht nutzen (Making use of examples from the history of biology in problem teaching and giving assignments in biology teaching)
Biologie in der Schule, 33, 1984, No. 11, pp. 421-422.

On the basis of four examples which all concern the structure and metabolism of higher plants, the author explains the importance of historical approaches to the formulation of problems and in giving assignments to pupils. The first example concerns the nutrition of plants, the second example the importance of carbon for plants, the third example the production of oxygen during the photosynthesis of plants and the fourth the importance of nitrogen for plants. For each example the author cites the history of the most important discoveries in the field.

didactics of biology - biology instruction - botany - historical method - GDR. 147307.

7.13 Problem teaching, project teaching

164. HORNÍK, F. - KADEŘÁBKOVÁ, M.:
Příspěvek k teorii a praxi problémové výuky
(A contribution to the theory and practice of problem teaching)
Přírodní vědy ve škole, 35, 1983-1984, No. 4, pp.122-124. Lit. 11.

One of the important aspects of effective biology teaching is the use of problem and project teaching methods. The basic prerequisite for their implementation is the creation of a suitable typology and classification of problem situations in class. The authors provide such a typology and classification of problem assignments connected with interviews, with the use of literature, with observations and with experiments. Specific examples which can be used in class work are cited.

didactics of biology - biology instruction - problem instruction - classification of assignment method - teaching methods - Czechoslovakia. 147309.

165. HUNT, P.M.:
Making Rounds with Dr. Semmelweis
The Science Teacher, 51, 1984, No. 1, pp. 33-37. Lit. 8. 1 photo, 3 tabs.

The author demonstrates the use of historical examples and the problem or project method of teaching in biology. Pupils become acquainted with outstanding biologists of the past who pioneered important new knowledge, such as Dr. Semmelweis, Needham, Jenner, Van Helmout, Spallanzani, Gieser, Schram and others.

didactics of biology - biology instruction - teaching methods - historical method - problem method - assignments - USA. 147309.

166. KALLINICH, W. - KUTZKE, M.:
Zum aktuellen Thema. Problemhaft gestelteter Unterricht - zwei Beispiele (On a current topic. Problem-orientated teaching - two examples.)
Biologie in der Schule, 33, 1984, No. 7-8, pp. 295-298.

On the basis of two examples from the biology course in the 8th class of basic school the authors demonstrate the possibility and advantages of using problem teaching methods. Her first examples concerns the teaching lesson devoted to an introduction to the problem of metabolism and the second example concerns the principles of correct nutrition. The authors analyse various teaching stages, claims of various types which lead to the creation of a problem situation, material media needed for this method and general problems of teaching strategies.

didactics of biology - biology instruction - problem teaching - teaching strategy - GDR. 147309.

7.15 The historical method in biology teaching

167. KATTMANN, U.:
Historische Aspekte der Biologie (Historical aspects of biology)
Der Biologieunterricht, 20, 1984, No. 4, pp. 1-4.

The whole issue of this journal is devoted to the problem of various historical aspects in biology teaching:

it includes a number of articles by specialists in various fields (genetics, evolution, systematics, biology as a science). The author stresses the importance of the historical method in biology teaching and in the study of biology as a science.

didactics of biology - biology instruction - historical method - FRG. 147309.

168. PFLUMM, W. - WILHELM, K.:
Einführung in die Abstammungslehre unter Gesichtspunkten der Systematik anhand historischer Texte (An introduction to evolution from the point of view of systematics, based on historical texts)
Der Biologieunterricht, 20, 1984, No. 4, pp. 5-15, Lit. 16
4 figs.

Problems of evolution can be found in the biology teaching syllabi of practically all classes in general education secondary school. The historical method in teaching biology provides opportunities to explain the idea of evolution in historical development. Historical texts from various periods are provided in the article (from Aristotle, Lamarck, Darwin) on the basis of which it is possible to practically demonstrate artificial classifications, artificial systems and systems based on natural classifications.

didactics of biology - biology instruction - evolution - historical method - FRG. 147309.

169. PFLUMM, W. - WINDELN, K. - STRIPF, R. - KATTMANN, U.:
Historische Texte zur Begründung von Systematika und Evolutionstheorie (Historical texts concerning the foundation of systematics and evolution theory)
Der Biologieunterricht, 20, 1984, No. 4, pp. 33-64, Lit. 32. 3 figs.

Historical texts which deal with systematics and evolution theory are selected from Aristotle, Conrad Gessner, Andreas Caealpinus, John Ray, Pierre de Maupertius, Carl von Linné, Georges Buffon, Jan Baptiste de Lamarck, Georges Cuvier, Etienne Geoffroy de Saint Hilaire and Charles Darwin.

didactics of biology - biology instruction - historical method - systematics - evolution - literature - FRG.
147309.

170. SEMENOV, I.N.:
D.I. Mendeleyev o selskom khozyaistve (D.I. Mendeleyev on agriculture)
Biologiya v shkole, 58, 1984, No. 1, pp. 17-21.

In 1984 the whole world commemorated the 150th anniversary of the birth of the great Russian chemist and discoverer of the periodic system of chemical elements, Dimitriy Ivanovich Mendeleyev. This great scientist dealt not only with chemistry, but was also an outstanding educator and he also devoted a great deal of attention to the economic problems of Russia, including such aspects as its petroleum, coal and ore extraction, the development of the chemical industry and also problems of developing agriculture. The article concentrates on Mendeleyev's ideas about farming, land reclamation and forestry. In conclusion the timely aspects of Mendeleyev's ideas on agriculture are stressed and that they should be studied.

didactics of biology - biology instruction - historical method - Mendeleyev - agriculture - USSR. 147309.

171. STEINMETZ, H.:
Einstiege in Themen der Genetik anhand historischer Quellen (An introduction to the topic of genetics on the basis of historical sources)
Der Biologieunterricht, 20, 1984, No. 4, pp. 16-32,
Lit. 23.

The author describes the use of a historical method in biology teaching, specifically as an introduction to genetics. On the basis of an amusing poem about the similarities between a mother and daughter and the daughter's choice of a spouse, the author discusses hereditary information. The historical method enables him to provide various information about genetics which can serve as a motivating factor in furthering pupils' interests. Historical literature serves to demonstrate the gradual development of human genetics.

didactics of biology - biology instruction - historical method - genetics - literature - FRG. 147309.

7.6 Biology curricula and teaching syllabi

172. BYBEE, R.W.:
Human Ecology: Curriculum Review
The American Biology Teacher, 46, 1984, No. 6, pp. 310-316.
1 photo

The author analyses and criticises curricula on human biology and human ecology. He has participated in the creation of a new curriculum and describes in detail the method of work used by the team which created the new curriculum. The main parts of the new curriculum include chapters on science and society, the Earth as a home for all of us, various farming stretegies and genes and the environment.

didactics of biology - biology instruction - ecology - human biology - cirriculum - USA. 147314.

173. GANEV, Z.:
Rezultati ot vnedryavaneto na novoto uchebno udrzhenie po biologiya v deseti klas (Results of verification of a new teaching syllabus for biology in the tenth class)
Biologiya i khimiya, 27, 1984, No. 1, pp. 24-28.

The biology curriculum for the 10th class includes subject-matter concerning cellular theory, bio-chemistry, molecular biology, comparative plant physiology and comparative animal physiology, genetics and a selection of topics from other fields. The author analyses the teaching syllabi on these subjects and eleborates criteria for selecting subject-matter for teaching in the 10th class. He analyses some topics in greater detail and describes how pupils react to and learn various topics.

didsctics of biology - biology instruction - curriculum - 10th class - content of class work - Bulgaria. 147314.

174. KLEIN, A. - THAMERUS, K.:
Empfehlungen zur Gestaltung von Biologielehrplänen
(Recommendations for drawing up school curricula)
Der mathematische und Naturwissenschaftliche Unterricht, 37, 1984, No. 5, pp. 300-309.

The cultural autonomy of individual Lands in the Federal Republic of Germany influences educational policy and hence also the creation of curricula, teaching aims, the content of teaching, teaching media and teaching syllabi which are actually in use. The authors on the basis of their own experience, provide various recommendations for the adjustment of curricula with the aim of achieving greater unity in general education secondary schools throughout the country. The authors provide a survey of the number of lessons devoted to various science subjects in various types of secondary school in different Lands of the Federal Republic and highlight the most important differences which should be overcome.

didactics of biology - biology instruction - curricula - teaching syllabi - secondary schools - FRG. 147314.

175. KURZE, M.:
Höhere Bildungs- und Erziehungsergebnisse in Klasse 8 - eine Bilanz der Diskussion zum aktuellen Thema
(Higher education and the educational results achieved in the 8th class - assessment of a discussion on a current theme)
Biologie in der Schule, 33, 1984, No. 10, pp. 358-364.

The author sums up the outcome of a discussion concerning the new biology teaching syllabus for the 8th class of basic school. He first points out that education towards a healthy life style, stressing human biology, worldview and political aspects, the utilization of interdisciplinary relations and finally the principle of taking into consideration individual specific aspects of pupils are all very important.

didactics of biology - biology instruction - teaching syllabus - 8th class - verification - GDR. 147314.

176. MALETZ. A.:
Higiena i zdrowie czlowieka - projekt realizacji w programe biologii v liceum ogólnokstalcacym. Profil podstawowy (Hygiene and human health - a project for implementing the teaching syllabus in a general education secondary school. Basic profile)
Biologia w szkole, 36, 1984, No. 2, pp. 110-111.

The author analyses the biology teaching syllabus for the 2nd and 3rd class of a general education secondary school and for each topic she analyses its connection and relation to subject-matter concerning hygiene and human health.

didactics of biology - biology instruction - teaching syllabus - general education secondary school - 2nd and 3rd class - Poland. 147314.

177. RAŠKOVÁ, S. - CHRISTOVA, R.:
Vazmozhnosti za realizirane na interaktivnite tendentsii v obuchenieto po biologiya v peti klas (Opportunities for implementing the integration of biology instruction in the 5th class)
Biologiya i khimiya, 27, 1984, No. 6, pp. 15-21. Lit. 8, 3 tabs.

The author cites various opportunities for integrating biology instruction in the 5th class, specifically by a synthesis of knowledge concerning Marxism-Leninism and biology (the unity of the world, processes connected with living organisms), by the integration of various sciences (mathematics, cybernetics, ecology, botany), by the ecologication of instruction, by the implementation of interdisciplinary relations, by stressing the close relationship between theory and practice and also by the use of technical media during instruction and by achieving unity between teaching and education.

didactics of biology - biology instruction - teaching syllabus - interdisciplinary relations - Bulgaria. 147314.

7.7 The study of existing curricula and teaching syllabi for biology instruction

178. CICHY, D.:
Przebieg i wyniki badan nad programem nauczania biologii z hygiena w klasie VIII (A description and findings of a study project concerning the biology and hygiene teaching syllabus for the 8th class)
Biologia w szkole, 37, 1984, No. 4, pp. 213-222. Lit. 7, 11 tabs.

The author reports on the findings of a study project on the teaching syllabus used in the 8th class of basic school where biology and hygiene are taught. The project took place in the period 1981 and 1982. The main purpose of the study was to empirically verify the draft of a new teaching syllabus for this class. The outcome of teaching according to the draft syllabus was verified on the basis of tests given to pupils.

didactics of biology - biolody instruction - hygiene - study of teaching syllabi - Poland. 147314.

7.9 Endeavours for modernization in biology instruction

179. RASKOVÁ, S. - PETKOV, V.:
Vazmozhnosti za prilozhenie na integralniya podkhod v uchebno-vazpitatelniya protses po biologiya
(Opportunities for using an integrated approach to the teaching and educational process in biology)
Biologiya i khimiya, 27, 1984, No. 3, pp. 28-33. Lit. 4, 5 digrams.

The problem of an integrated approach to the teaching and educational process is the problem of the many-sided development of the personality of young people based on a teaching syllabus and whole curriculum which includes both mandatory and elective subjects. The authors deal in detail with the teaching syllabus for the subject "The general scientific and psychophysiological foundations of higher nervous activity". The subject has two lessons a week set aside for it, annually 62 lessons. Individual topics include "The structure and function of living systems", "Reflections of objectively existing realities", "Man - biology - society". Individual topics are discussed from a didactical point of view, so that the impact made on pupils is an integrated one.

didactics of biology - biology instruction - modernization of instruction - elective courses - Bulgaria.
147307.

8.1 The didactical principle of a scientific approach

180. DOBROWOLSKI, K.A.:
Rola nauk przyrodniczych w ksztaltowaniu naukowego swiatopogladu mlodiezy (The role of the natural sciences in creating a scientific worldview in youth)
Biologia v wzkole, 37, 1984, No. 4, pp. 234-238.

The PWN Publishers in Poland have published a Large Encyclopedia for Youth, which provides a wealth of material also for biology teaching and for the creation of a scientific worldview among young people who attend school.

didactics of biology - biology instruction - didactical principle of a scientific approach - encyclopedia - Poland. 147309.

8.2 The didactical principle of combining school work with every-day life. The regional and current principles.

181. HORN, F.:
Princip Lebensverbundenheit - Schlussfolgerungen aus Auffassungen zur polytechnischen Bildung im Biologieunterricht der sowjetischen Schule (The principle of combining school and every-day life - a consequence of the approach to polytechnical education in biology instruction in Soviet schools.)
Biologie in der Schule, 33, 1984, No. 4, pp. 119-123.

The organic combination of school and every-day life is an essential characteristic of socialist school. The contribution of biology in this context, however, is often underestimated; for this reason the author acquaints readers with the predominant approach to this important problem in Soviet schools and in the works of Soviet authors. The components of the system of polytechnical education can be summed up in the following points stressed in instruction: 1. The scientific foundations of agriculture, the industries based on microbiological processes and the conservation of the environment. 2. Acquainting pupils with the technology and techniques which assure the high productivity of biological systems and which also increase the productivity of labour. 3. Explaining the use of biological laws in every-day life. 4. Basic knowledge about important industries and participation in socially beneficial work. A necessary prerequisite for the implementation of the polytechnical principle in biology instruction is a good knowledge of biology. The author also points to important aspects of polytechnical education which concern the utilization of modern scientific knowledge, the polytechnical significance of traditional and modern biological disciplines, ecology and nature conservation and also health-care education.

didactics of biology - biology instruction - combining school work with every-day life - polytechnical education - USSR - GDR. 147309.

182. Idei shkolnoy reformi - v zhizn (The practical implementation of the school reform)

Biologiya v shkole, 58, 1984, No. 4, pp. 3-6.

The school year 1984-1985 will be the first year in which the new school reform will be implemented in the USSR. The task of every educator is to improve the quality of both general education and vocational schools, to provide pupils with extensive and permanent knowledge, skills and to improve the content of class work, as well as making practical use of the opportunities the specific subject-matter taught provides for the forming of a scientific worldview in pupils. Pupils should also be led towards implementing the knowledge they have gained in practical work they do in school and outside the schools.

didactics of biology - biology instruction - didactical principle - combining school and every-day life - USSR. 147309.

8.3 The didactical principle of educational instruction

183. TISHCHENKO, V.I.:
V.I. Lenin i aktualnie problemi nauchnogo ateisma
(V.I. Lenin and current problems of scientific atheism)
Biologiya v shkole, 58, 1984, No. 2, pp. 10-15.

In accord with the teachings of V.I. Lenin, and also with current Party and Government resolutions, the author stresses that the strength of the socialist state is based on an awareness of the masses. An indivisible component of communist education is atheistic education and atheistic propaganda. At present atheistic education is of special importance because the churches and foreign agencies have increased their activities in connection with the so-called 1000th anniversary of the "christening of Russia".

didactics of biology - biology instruction - didactical principle - educational teaching - atheist education - USSR. 147309.

8.6 The didactical principle of combining theory and practice

184. SHTANG, I.R. - SHCHEGOLOV, J.V.:
Nam porucheno vazhnoe delo (We have been entrusted with an important task)
Biologiya v shkole, 58, 1984, No. 3, pp. 60-61.

Contemporary science and technology require that people in school become acquainted with new methods of work used in the cultivation of agricultural crops. The author describes a long-term experiment which was carried out at the Nikitinskiy state farm and in which the pupils of the S.M. Kirov school, found in the same region, also participated. The experiment concerned the pre-planting treatment of the seeds of some strains of spring wheat and buck wheat with the aid of laser beams which stimulate the seed to early germination. The experiment took three years and contributed to the fulfillment of the Party's Food Program. The pupils were able to see for themselves the advantages of farming on scientific foundations.

didactics of biology - biology instruction - combining theory and practice - Food Program - agricultural experiments - USSR. 147309.

185. WENDE, B.:
Durch Einbeziehung territorialer gesellschaftlicher Probleme lebensverbundener Unterrichten (Combining instruction and practical work to a greater extent on the basis of utilizing territorial social problems) Biologie in der Schule, 33, 1984, No. 2-3, pp. 97-99.

The solution of the problem cited in the title of the article requires long-term planning of various classroom activities. The author describes her own experiences. The activities of all teachers should be based on a plan which specifies educational objectives and the content of Party resolutions, as well as territorial aspects and a methodological and didactical concept. Practical experiences are analysed on the basis of the example of subject-matter taught in the 9th class, specifically in the topic "The organism and its environment."

didactics of biology - biology instruction - 9th class - didactidal principle - combining theory and practice - GDR. 147309

8.7 The didactical principle of taking into account the individuality of each pupil

186. HEINZEL, I.:
Bewusst mit Aufgaben unterschiedlichen Anforderungsgrades arbeiten! (Assignments of various degrees of difficulty should be used in an aware manner!)
Biologie in der Schule, 33, 1984, No. 1, pp. 17-18.
1 fig.

For supporting pupils' activities it is important that they participate in class work and that all opportunities for extending pupils' knowledge be used. Various approaches to this objective, which assumes differentiated work, can be achieved by using various types of questions and assignments, which the author demonstrates on the basis of the subject-matter taught in the 8th class. The assignments include the description, definition and systematic ordering of various objects and phenomena.

didactics of biology - biology instruction - didactical principles - individual approaches to pupils - GDR.
147309.

87. KÖHLER, R.:
Hospitiert und kommentiert, Einheitlichkeit und Differenzierung im Unterricht (Comments based on visits to classrooms: unity and differentiation in class instruction)
Biologie in der Schule, 33, 1984, No. 12, p. 477.

On the basis of numerous visits to classrooms the author makes various recommendations as far as the unity

147

of class instruction is concerned. The subject-matter taught in the 7th class concerns the systematics of higher plants. After the pupils learnt about the basic division of plants into angiosperms and gymnosperms, pupils were divided into three groups, each of which received a different assignment. The first had the task of defining angiosperms and gymnospersm, the second compared the leaves and roots of both types of plants and the third did work in the systematic classification of some plants. In conclusion each group presented the outcome of its work to the whole class.

didactics of biology - biology instruction - botany - systematics - didactical principles - individual approach - GDR. 147309.

188. **NAVRÁTILOVÁ, K.:**
Učenie o prírode a spoločnosti z hladiska mentálného vývoje žiakov (Learning about nature and society from the point of view of the mental development of pupils) Komenský, 108, 1983-1984, No. 1, pp. 24-27. Lit. 9.

The reform in which the concept of teaching about nature and society has been restructured takes into consideration the stage of mental development of younger school children and creates the prerequisites and conditions for the systematic further adequate development of intellect characteristics and abilities of pupils. The textbooks for civics and for nature studies, by their content,as well as technical presentation, successfully attract the attention of pupils and arouse in them an interest in further knowledge. They also create in children the prerequisites for future learning about the environment in which they live. The personality of each pupil should be developed in forms which are adequate to his or her age, in a continuous and systematic manner. Education should always be approached as a comprehensive objective.

didactics of nature studies - instruction in nature studies - individual approach - basic school - younger school children - Czechoslovakia. 147309.

189. RODZIK, H.:

Jak indywidualizuje prace uczniow w nauczaniu biologii?

(How can we individualize the work of pupils in biology instruction?)

Biologia w szkole, 36, 1984, No. 2, pp. 102-105.

Pupils within a single class often differ as far as their interests, intelligence, temperament, motivation and reaction to school work are concerned. An individual approach makes it possible to make maximum use of the abilities of each pupil through individual assignments. It is important to work with exceptionally talented pupils, who should be given additional literature for study and shown various science films, etc. The author also discusses working with pupils whose school performance is poor within teaching lessons. Examples are cited of using journals in 7th class instruction concerning such topics as conservation of the air, water and soil.

didactics of biology - biology instruction - didactical principles - individual approach - 7th class - Poland. 147309.

190. WALICKA, T.:
Nauczyć tworocsí myśleć (Teaching creative thinking)
Biologia w szkole, 1984, No. 2, pp. 91-98. Lit. 3.

An individual approach to secondary school pupils provides numerous opportunities for fulfilling the objectives of instruction and at the same time developing pupils' knowledge, interests and acquainting them with specialized literature. In biology, combining theory and practice is of special importance. This can be done in practical excercises, laboratory work during excursions and field work. The author describes how such work creates a proper atmosphere in which pupils learn well and prepare for their school leaving examinations. She discusses separately pupils who have no interest in biology, those who have a medium interest and those whose interest is such that they wish to study biology or biology-related subjects at an institution of higher learning. It is also necessary to distinguish pupils who are active and have a good sense of organization and those pupils who have a more profound interest in biology as a science.

didactics of biology - biology instruction - secondary school individual approach - Poland. 147309.

191. WYSOKIŃSKI, J.:
Nauczyciel - artysta (The teacher as an artist)
Biologia w szkole, 36, 1984, No. 2, pp. 83-91.
6 figs., 2 tabs.

The author stresses the importance of an individual approach to pupils and describes the great versatility of pupils and the different degrees of interest they have in biology. There are also differences in the way pupils perceive new subject-matter and in their own sensory apparatus. Difference in the mental apparatus of pupils should be taken into account, as well as differences in their interests and their work techniques. The author discusses sensory disorders among pupils which are relevant to class work, such as left handedness, the ability to concentrate during observations, learning to draw, etc. On the basis of a detailed analysis of differences among pupils the author draws conclusions about the need to have a differentiated and individual approach to various pupils.

didactics of biology - biology instruction - individual approach to pupils - Poland. 147309.

8.8 The didactical principle of taking into account interdisciplinary relations

192. CLAUS, H.J.:
Wie pflanst man Bäume im einen Quadrat (How to cultivate trees in a square)
Der mathematische und naturwissenschaftliche Unterricht, 37, 1984, No. 8, pp. 468-475. Lit. 5,
21 figs., 3 tabs.

The author describes the mathematical aspects of applied biology problems. Here he deals with the planting of trees and shrubs on a square shaped area and the distance which must be maintained between individual plants. This is a typical interdisciplinary problem which has interesting practical applications on school plots of land or when pupils work in the gardens attached to their homes.

didactics of biology - biology instruction - interdisciplinary relations - mathematics and biology - gardening - FRG. 147309.

193. GOLOVINSKI, E.:
Poznaniyata po biokhimiya kato osnova za mezhdupredmetnite vrzki na khimiyata s biologiyata (Biochemical knowledge as the basis for interdisciplinary relations between chemistry and biology)
Biologiya k ihimiya, 27, 1984, No. 1, pp. 18-23. Lit. 7.

At present the school curriculum includes scientific disciplines which are isolated from each other, in spite of the fact that the importance of border line disciplines is constantly increasing. This can be clearly seen in the insufficient use of biochemical knowledge in chemistry teaching. Essentially, biochemistry is the science of life and its principles should be taught within the framework of biology to a much greater extent than is the case, especially for the clarification of all physiological processes. Descriptive biochemistry should be differentiated from functional and applied biochemistry. The author also describes some methods which should be used both in biology and chemistry teaching in secondary schools.

didactics of biology - biology instruction - interdisciplinary relations - biology and chemistry - secondary schools - Bulgaria. 147309.

194. GRÄBER, W. - STORK, H.:

Die Entwicklungspsychologie Jean Piagets als Mahnerin und Helferin im naturwissenschaftlichen Unterricht - Teil 2 (Jean Piaget's developmental psychology as a remainder and an aid in science teaching - Part 2.)
Der mathematische und naturwissenschaftliche Unterricht, 37, 1984, No. 5, pp. 257-269.
8 figs., 5 tabs.

The authors inform readers on the use of a Lawson test to differentiate specific and formal metal operations by pupils in secondary schools in the FRG. A.E. Lawson, from the University of California at Berkley, used Jean Piaget's developmental psychology together with various other material to carry out psychological observations and studies. The experiment described included 354 pupils from the 10th class of general education secondary schools (152 boys and 202 girls). Findings: three distinct groups were found to exist: 1. testees in the formal operation stage; 2. testees in the intermediate stage between specific and formal operations and 3. testees in the specific operational stage. Group 2 predominated (66.1 %), followed by group 1 (24.3 %)and group 3 (9.6 %). The authors draw various conclusions from the test data.

didactics of biology - biology instruction - developmental psychology - natural sciences - study - FRG. 147309.

195. LEEPER, F.:
Integrating Biology and English
The American Biology Teacher, 46, 1984, No. 5, pp. 280-281. 288.

Often one hand does not know what the other is doing. At a school in Midland, Texas there are 150 teachers. The author of the article is an English teacher. Together with a biology and physiology teacher she has developed a plan of cooperation. They make use of texts which have biological subject-matter, for instance "What is genetics", "Molecular biology", "Human digestion", and "Tissues in the human body". Cooperation between a biology and English teacher has proven to be beneficial for the teaching of both subjects.

didactics of biology - biology instruction - interdisciplinary relations - English and biology - USA.
147309.

196. NUROV, N.:
Zvuchat stikhi na urokakh biologii (Poetry can be heard in biology lessons)
Biologiya v shkole, 58, 1984, No. 1, p. 47.

The author describes her experience of fifteen years as a biology teacher and how she has made use of the poetry of Tadzhik, Russian and Soviet poets when she wishes to emotionally influence her pupils during a lesson by poetry which is related to the subject-matter taught. In this way interdisciplinary relations between biology and Russian are implemented. In the article several examples are cited of the poetry of the Tadzhik poet, national artist Mirzo Turzun-Zade which can be used in botany lessons in the 6th class.

didactics of biology - biology instruction - interdisciplinary relations - Russian and biology - 6th class - USSR. 147309.

197. SCHÖNFELDER, R.:
Realisierung des muttersprachlichen Prinzips in Klasse 5
(Implementing the principle of using the mother tongue in the 5th class)
Biologie in der Schule, 33, 1984, No. 6, pp. 242-244.

Also in biology instruction the ability to communicate verbally should be cultivated. The new teaching syllabus for German in the 5th class specifically requires cooperation with biology teaching. The method of implementing this principle includes developing skills for understanding a text, a description of various objects and processes, explanations and how to provide brief and clear information.The author describes how she uses these methods in her class work.

didactics of biology - biology instruction - interdisciplinary relations - biology and German - 5th class - GDR. 147309.

9. Methods of biology instruction

9.5 Interview method

198. KNÖPLER, C.:
Organisierte Gruppendiscussionen - eine Möglichkeit zur Einbeziehung vieler Schüler in das Unterrichtsgespräch (An organized group discussion - an opportunity to draw many pupils into the discussion) Biologie in der Schule, 33, 1984, No. 10, pp. 378-379.

One of the often stressed educational objectives of modern schools is to guide pupils towards independent learning and the formulation of their own opinions. Group discussions are a suitable method of achieving this objective. The author sums up the prerequisites for the successful organizing of such discussions: defining basic subject-matter, the teacher's good knowledge of pupils' mental activities, becoming used to this form of instruction. Pupils form groups of 5 to 6 pupils. The most important thing is to have each pupil express his or her opinion on the given problem. Specific examples are cited concerning the subject-matter of human evolution.

didactics of biology - biology instruction - human biology - evolution - teaching method - group discussion - GDR. 147309.

9.6 Method of work with literature (textbook, syllabus, workbook, worksheet, atlas, keys for determining flora and fauna)

199. Formirovanie u shkolnikov umeniy rabotat s uchebnikom - odin iz putej normalizatsii uchebnoy nagruzki
(Teaching pupils to work with textbooks - one of the methods of normalizing teaching loads)
Biologiya v shkole, 58, 1984, No. 5, pp. 19-25.
1 outline, 4 tabs.

Three members of the staff of the Academy of Pedagogical Sciences of the USSR here report on the findings of a study concerning textbooks and their use in schools. Systematic work with a textbook is one of the basic prerequisites for increasing the efficiency of instruction and overcoming the excessive burdening of pupils with school work. They cite specific examples for utilizing textbooks for the independent work of pupils and teaching them the skills required for the use of the biology textbook.

didactics of biology - biology instruction - teaching method - use of textbooks - USSR. 147309.

200. FREJLAK, S.:
Realizacja działu "Podstawy klasyfikacji roślin i zwierząt" w klasie VI szkoly podstawowej (Teaching the topic "The foundations of flora and fauna classification" in the 6th class of basic school)
Biologia w szkole, 37, 1984, No. , pp. 36-40.
Lit. 4, 2 tabs.

The author discusses the use of atlases and keys for the classification of flora and fauna, which make it possible to systematically learn about classification and terms which systematics use. The authors assume three teaching lessons for this topic, divided into the following: 1) the foundations of the classification or living organisms; 2) identifying plants according to keys and atlases and 3) identifying fauna according to keys and atlases.

didactics of biology - biology instruction - teaching method - use of literature - identification of flora and fauna - systematics - basic school - Poland.
147309.

9.7 Method of observation

201. BARKER, J.:
Observing Dytiscus marginalis
The School Science Review, 66, 1984, No. 234, pp.92-93.
2 figs.

The insect Dytiscus marginalis is suitable for observations in school biology. The author describes its collection, how to distinguish the male and female and how to breed it in an aquarium. The female lays eggs into the roots of reeds. The larvae are highly predacious and in seven weeks the beetles appear. The author provides various interesting notes on the breeding of this insect in school and how it can be observed by pupils.

didactics of biology - biology instruction - zoology - insects - breeding in school - observations - Great Britain. 147309.

202. BRETSCHNEIDER, J.:
Beobachtungen und Experimente - einige Erfahrungen, Anforderungen und Schlussfolgerungen (Observations and experiments - some experiences, requirements and conclusions)
Biologie in der Schule, 33, 1984, No. 12, pp. 454-458.

Observations and experiments are the most important teaching methods used in biology instruction, but for all practical purposes, insufficient attention is devoted to them. The concept of socialist general education ascribes great importance to pupils´ activities and their theoretical,as well as practical aspects. On this basis the author comes to the following conclusions: 1. If the observation and/or experiment is successful depends upon how well the teacher has prepared for class work and how well he understands the subject-matter. 2. The educational and teaching objective of the observation and/or experiment should be correctly defined. 3. It is important to know how to use the scientific methods of biology for school observations and experiments.

didactics of biology - biology instruction - observations - experiments - teaching methods - GDR. 147309.

203. DYK, V.:
Fenologie živočichů - 2. Volba stanoviště
(Fauna phenology - 2. Choice of site)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 2, pp. 6-7, 1 photo, 1 fig.

The author here continues in a series of articles on phenology and its use in biology instruction and in independent observations by pupils. Among the important aspects of phenological observations are the choice of a site and experimental and control area, its easy access, taking regular notes in the course of the observation and also the sufficient incidence of the living organisms to be observed. For phenological observations of vertebrates an area much larger than for the study of invertebrates is required. For invertebrates a small area is sufficient if it contains an adequate biota. The author cites specific examples.

didactics of biology - biology instruction - teaching method - observation - phenology - zoology - Czechoslovakia, 147309.

204. DYK, V.:
Vodní zvířata. Fenologie živočichů IV.
(Acquatic fauna. Fauna phenology IV.)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No.4, pp. 6-7. 2 figs.

Phenological observations of aquatic fauna are highly suitable as a component of the study of polluted waters. Observations of plankton are suitable only for hobby clubs, because they require the use of a microscope, but larger aquatic invertebrates are more suitable for observations. The author describes the behaviour of various aquatic insects and provides various advice on how to go about organizing such observations by pupils.

didactics of biology - biology instruction - hobby clubs - ecology - aquatic fauna - insects - observations - water pollution - Czechoslovakia. 147309.

205. DYK, V.:
Život kolem vod. (Living organisms in the vicinity of water)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 3, p. 7.

Here the author concentrates on opportunities for organizing phenological observations of pupils in the vicinity of water areas. He acquaints the reader with various phenological signs. Ideal objects for observations in aquatic areas are amphibians and various insects, including mosquitoes and flies, but also birds.

didactics of biology - biology instruction - hobby clubs - phenology - observations - vertebrates - insects - Czechoslovakia. 147309.

161

206. DYK, V.:
Život v lese. (Fenologie živočichů IV.)
(Living organisms in the forest - Fauna phenology IV.)
ABC mladých techniků a přírodovědců, 28, 1983-1984,
No. 6, pp. 6-7.
3 photos.

The community of living organisms found in the forest can form a suitable object for observations during excursions and also for hobby club work. Phenological observations can be especially successful in cultivated forests, as well as in coniferous or mixed forests. Even large mammals such as deer and rabbits, but also small rodents and insectivores, apmhibians, reptiles, as well as insects can be observed. The author cites numerous examples of animals suitable for observations.

didactics of biology - biology instruction - hobby club - observations - phenology - animals - forest - Czechoslovakia. 147309.

207. GAŁKA, B.:
Niektore spotrzezenia o zachowaniu jelenia (Some observations on the behaviour of the European deer)
Biologia w szkole, 37, 1984, No. 3, pp. 153-156.
Lit. 7.

The author describes in detail the biology and ethology of the European deer (Cervus elaphus). He describes the methods by which this animal can be observed throughout the year. For optimum results a whole herd should be observed, with a sufficient number of animals and in a natural environment. At the same time the animals should be used to the presence of man. Pupils can observe age, sex and hierarchy within the herd and the behaviour of individual animals. The author also describes how he observed the birth of a young animal and the behaviour of the mother afterwards. The article brings a number of surprising information about this animal.

didactics of biology - biology instruction - observations - artiodactyls - ruminants - ethology - Poland. 147309.

208. FUFAEV, A.A.:
Fenelogicheskie nablyudeniya na shkolnom uchastke
(Phenological observations on a school plot of land)
Biologiya v shkole, 58, 1984, No. 4, p. 49.

The author cites his own experiences as a teacher in a secondary school in Kunguru, in the Perm region. Phenological observations carried out on the school plot of land greatly simplify the understanding of the technology of crop cultivation and also contributed to the ecological education of pupils. Knowledge of pheno stages and when they occur helps pupils to draw up a time schedule for various work and other activities during the summer.

didactics of biology - biology instruction - teaching method - observations - phenology - school plot of land - secondary school - USSR. 147309.

163

209. GOLDSMITH, J.:

"Home on the Range". Learn what animals do in this orientation activity

The Science Teacher, 51, 1984, No. 2, pp. 32-33.
1 fig.

The author provides information on an interesting problem - the orientation of humans in an unknown environment. This problem also concerns animals in an environment where they seek shelter or a place to build a nest, find food and water, etc. Most animals create own territory with well defined boundries. The article contains an assignment for pupils, with a picture of the "range", where they seek orientation and are given specific information about the landscape which will help them in orientation. Pupils work in groups.

didactics of biology - biology instruction - teaching methods - observations - zoology - USA. 147309.

210. HANROTT, H.:

Minibeast - A Class project

Teaching Science, 2, 1984, No. 2, pp. 3-5. Lit. 21
8 figs. 1 tab.

The author describes a class project in the observation of small fauna, which can take place during an excursion. Pupils look for the animals under rocks, under old logs, under the bark of trees, etc. The minibeasts of the title are insects of various species. Samples are collected, the environment observed and notes taken, based on measurements. Also various objects can be drawn and animal behaviour observed. The project described is very interesting and from an educational point of view commendable because it leads to independent work by pupils who learn modern biological methods of study. Stress is also placed on interdisciplinary relations.

didactics of biology - biology instruction - teaching method - observation - zoology - invertebrates - insects - interdisciplinary relations - Great Britain. 147309.

211. KALLAS, J.N.:
Wild Marsh mallows
The Science Teacher, 51, 1984, No. 5, pp. 46-52. Lit. 52, 4 photos, 5 tab.

The author demonstrates the use of a very widespread and common plant, the dwarf mallow (Malva neglecta), of the Malvaceae family, in botany teaching. However, a longer list of plants (a total of 27) is cited which are also common and suitable for the purpose of class work in botany. They should be collected during excursions and then used in botany lessons. This type of work leads to a high level of pupil activity.

didactics of biology - biology instruction - observations - botany - excursion - pupil activity - USA. 147309.

212. KLUCHNIKOV, S.N.:
Babochka pod mikroskopom (A butterfly under the microscope)
Biologiya v shkole, 58, 1984, No. 3, pp. 73-74,
6 photos, 1 fig.

The author discusses observations of butterflies by pupils. Butterflies are very interesting and suitable for the study of insects, where the structure of their bodies, their behaviour, biology and ecology can all be observed. Butterflies are also suitable for microscopy work, where their sensory organs and structure of wings can be observed. The author recommends that these observations be organized both outdoors and in biology laboratories. Also work with butterflies in hobby clubs or in elective biology courses is discussed. Nature conservation regulations must of course be taken into account and only pest species collected.

didactics of biology - biology instruction - observations - microscopy - hobby clubs - insects - USSR.
147309.

213. KRISCHKE, N.:
Informationen zum Lernverhalten der Mongolischer Rennmaus (Meriones unguiculatus im Y-Labyrinth. Eine Anregung zur Durchführung von Lernversuchen in der Sekundarstufe I. (Information on the learning behaviour of the Mongolian gerbil (Meriones unguiculatus) in an Y-labyrinth. Instructions for carrying out a learning experiment in the lower classes of secondary school)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 6, pp. 197-202. Lit. 19,
2 figs. 1 worksheet, 1 worksheet with solution.

The author describes an ethological experiment with a Y-labyrinth in which a Mongolian gerbil learns various tasks for thich he is rewarded or punished. Pupils learn about carrying out control experiments, observing behaviour and compiling data. The author provides various advice for carrying out the experiment in school.

didactics of biology - biology instruction - zoology - ethology - observations - mammals - rodents - FRG.
147309.

214. LENOIR, A. - JAISSON, J.:
Pour étudier quelques types de comportements de la fourmi (On the study of some types of ants)
Biologie-Géologie, 71, 1984, No. 2, pp. 312-322.
8 figs.

The authors describe the collection and assessment of data on some types of ants, their identification and classification , how they can be bred in school, their feeding and how to carry out ethological observations with ants. They also describe how ants care for their eggs, their food behaviour, how they transport food, etc.

didactics of biology - biology instruction - zoology - ethology - observations - experiments - breeding insects - France. 147309.

215. LUTJE, E.:
Galapagos ist überall - Beobachtungsmöglichkeiten im Schulgelände (The Galapagos are everywhere - opportunities for observations on a school plot of land)
Der mathematische und naturwissenschaftliche Unterricht, 37, 1984, No. 8, pp. 494-503. Lit. 10, 11 figs.

The author describes the use of a small area for the observation of various animals, for instance insects. The observations can concentrate on ecological and/or ethological factors, the identification of plants and animals on the basis of a key and also the monographic description of a specific biota. Such observations and experiments can also be undertaken on a school plot of land.

didactics of biology - biology instruction - teaching methods - observations - insects - FRG. 147309.

216. MILES, P.:
Kam odlétají? (Výzkum ptačího tahu v Krkonoších)
(Where do they fly to? A study of bird migration in the Krkonoše mountains)
Krkonoše, 17, 1984, No. 2, pp. 6!7.
5 figs.

Banding birds has made it possible to determine the age, sex, date and place of landing, direction of migration, date and place of nesting and duration of monogamy among birds. Birds have been caught and banded in the Krkonoše mountains since 1971; this activity has contributed to an international project for the study of fauna in the Baltic sea and its coast. The birds are caught in the spring and fall into large ornithological nets which are 6 meters high. Until now already 50.000 birds have been banded in the Krkonoše mountains. Under optimum conditions tens of thousands of birds migrate over the Krkonoše mountains. The author describes the directions of this migration and other interesting findings gained from this project.

didactics of biology - biology instruction - observations - birds - Krkonoše mountains - Czechoslovakia. 147309.

217. MIODUSZEWSKA, V.:
Obserwacje roślin ozdobnych - kroton (Observations of decorative plants - Croton)
Biologia w szkole, 37, 1984, No. 1, pp. 55-57.

The croton is a plant 25 - 30 cm high, a member of the Euphorbraceae genus. The genus to which these plants belong includes 600 specie of trees and shrubs from equatorial America. The author describes some of these species and how the plant can be cultivated in school. She herself has been cultivating the plant since 1979. It bloomed from 1979 to 1981. She then pollinated the plant and fruits have developed. This plant shoots out seeds. The author recommends cultivating the plant in a living nature room and observing its development.

didactics of biology - biology instruction - observations - decorative plants - Poland. 147309.

218. MOREL, J.C. - MOLLO, P.:
La croissance chez le Cailleteau (The development of quail)
Biologie - Géologie, 71, 1984, No. , pp. 120-121, 2 figs., 3 tabs.

The authors describe observations and experiments with the breeding of young quail. They can be bred as chicks, from the age of one week, in groups of threes or fours, in special cages. They can be fed with varied food (special mixtures, dairy products made for human babies, wheat flour, etc.). The authors also describe the commercial breeding of quail. The outcome of feeding the quail with various kinds of food are mutually compared in various tables.

didactics of biology - biology instruction - zoology - observations - birds - feeding - France. 147309.

219. OPENSHAW, P.:
River pollution - Part II. Biological methods for assessing water quality
The School Science Review, 65, 1984, No. 231, pp. 460-474.
Lit. 20, 9 figs., 3 tabs.

The author describes the methods of acquiring and assessing data concerning fluvial water pollution used by students in school. He describes how samples can be taken in a 20 km long section of the river. The study concerns mostly plankton for which a list of specie and families are provided. The author explains how their numbers can be calculated and water quality scores compiled which indicate water quality. The subject-matter is especially suitable for groups of students who work independently on projects related to environmental problems.

didactics of biology - biology instruction - observations - nature conservation - water pollution - Great Britain. 147309.

220. OPENSHAW, P.:
Measure adaption and selection pressures
The School Science Review, 65, 1984, No. 232, pp.508-518.
Lit. 15, 4 figs., 3 tabs.

The author describes school observation projects for which only simple facilities are required (a ruler and a mini-calculator), and used for the observation of the molluscs Patella bulgata, Patella intermedia and Patella aspera. Their shape tends to vary a great deal and it is possible to demonstrate selection and the adaptation of living organisms on their basis. The size and shape of their shell are influenced by external factors and selection pressure. The intensity of selection pressure can be assessed on this basis.

didactics of biology - biology instruction - zoology - molluscs - excursion - observation - selection - adaption - Great Britain. 147309.

221. RIDET, R.:
Determination des restes ossaeux craniens continus dans les pelotes de rejection d'une rapace nocturne: La chouette efraie (Identifying the remnants of cranial bones in the pellets of owls: the Barn owl)
Biologie - Géologie, 71, 1984, No. 1, pp. 129-134.
4 figs.

On the basis of many years of experience the author describes her work with pupils in the collection of owl pellets from the Barn owl (Tyto alba) and analysing them. On the basis of the remnants of bones, especially craniums, pupils can learn to identify the food of this bird of prey. This project can be undertaken with 6th class pupils.

didactics of biology - biology instruction - zoology - birds - owls-observations - prey - France. 147309.

222. RICHTER, L.:

Eine Variante zur Untersuchung des Pilzwachstums bei unterschiedlichen Feuchtigkeitsbedingungen (An alternative for studying the growth of fungus in variously damp environments)
Biologie in der Schule, 33, 1984, No. 11, pp. 422-423.

The biology teaching syllabus for the 9th class includes the topic "The tolerance of organisms to all factors in the environment", which requires experiments aimed at the development of fungus and its growth in variously damp environments. The author describes his own experience in teaching this topic and carrying out its qualitative assessment. The experiment is done by filling a test tube with pieces of bread to which moisture is added and then the fungus is transferred into the test tube. After 10 days the size of the mycelium can be measured.

didactics of biology - biology instruction - fungi - observations - experiments - GDR. 147309.

223. RODI, D.:

Beobachtungen, Untersuchungen und Modellversuche zum Waldsterben in Biologieunterricht der Sekundarstufe
(Observations, research and model experiments on the dying of the forests in biology instruction in the upper classes of secondary school)
Der mathematische und naturwissenschaftliche Unterricht, 37, 1984, No. 7, pp. 385-394. Lit. 19, 14 figs.

The dying of the forests has in recent years reached catastrophic dimensions. For this reason this problem should also be dealt with in biology instruction in all types of schools. An extensive literature has been published on the subject, as well as various teaching materials and media, films, slide series, pictures, etc. The author provides the plan for a student seminar on this subject which is included into teaching on the forest eco-system in the 7-8th classes, into the topic "Conservation of the environment" in the 9th - 10th classes, and into the topic "Ecology" in the 11th - 13th classes. This subject-matter stresses interdisciplinary aspects, especially with chemistry. The model experiments described can be very useful.

didactics of biology - biology instruction - ecology - environmental conservation - teaching methodology - observations - experiments - upper classes of secondary school - FRG. 147309.

224. SCHOM-KUSSI, U. - SCHULTE, H.:
Assimilationsstärke in Chloroplasten - ein zuverlässiger Nachweis für die mikroskopische Schülerübung
(Assimilation of starch in chloroplasts - suitable proof for pupil microscopy excersises).
Naturwissenschaft im Unterricht - Biologie, 32, 1984, No. 6, pp. 202-204. Lit. 10.
2 microphotos.

The author provides various suggestions for the making of better microscopy specimens for observations concerning proof of starch assimilation in chloroplasts. In contrast to the usually used method which uses an iodine acid solution with chloralhydrate, which does not always yield good results, she suggests the use of moss which is placed in a 1 % solution of OH acid and only subsequently into an iodine solution. This method yields sure results.

didactics of biology - biology instruction - botany - assimilation - starch - observation - experiment - FRG. 147309.

225. SIFFOINTE, R.:
Quelques observations dans la nature et expériences en classe de cinquiéme (Some observations of nature and experiences which are suitable for the 5th class)
Biologie - Géologie, 71, 1984, No. 2, pp. 330-333.
3 figs., 4 tabs.

The author recommends for the 5th class observations of ants outdoors. She describes how to find an ant hill of the Lasius, Camponotus or Formica specie of ants, how to take suitable samples for founding a school ant hill and how to provide it with thermal regulation. Observations concern feeding and social behaviour.

didactics of biology - biology instruction - zoology - observations - experiments - breeding ants - invertebrates - insects - France. 147309.

226. SUTER, R.B.:
Wasp Work - An anytime study of summer processes
The American Biology Teacher, 46, 1984, No. 1, pp. 18-22.
Lit. 64, 4 photos, 4 figs.

Wasp communities are very interesting objects for observations, especially from various ethological aspects. The author discusses the biology and systematics of wasps (Vespula sp.). In the fall the wasps leave their nests, copulate, the males die and the fertilized females hybernate. In the spring they found new nests and new communities. Students learn about ethological aspects, as well as zoology.

didactics of biology - biology instruction - teaching methods - observations - zoology - insects - USA. 147309.

227. ŠKOUDLÍN, J.:
Invaze do měst (An invasion into cities)
ABC mladých techniků a přírodovědců, 28, 1983-1984,
No. 20, p. 28-

Due to changes in the environment changes in coenoses are taking place and bio-coenoses which have fewer species of plants and animals and which are less biologically variable are developing. Some organisms, however, are ecologically highly variable, for instance the Rock dove (Columba livia), which is found in Czechoslovakia in large wildly living urban communities. This specie is conquering the whole world, especially urban agglomerations. The place of their origin is not known with any precision. Approximately 5 million of them live in New York. But modern functional architecture provides them with few opportunities to build nests. However, in the USA they have managed to adapt. Also the Collard turtle-dove has proliferated and now presents a hazard to other birds. Raids of pigeons and doves on planted seeds in fields are becoming a serious problem. They deplete cereals in fields and also in storage by soiling them. They also harm historical and cultural monuments and are a source of some diseases which are transferable to humans (Salmonellosis, viral encephalitis, histoplasmosis, bird's tuberculosis), as well as some parasites. Hygiene officers consider pigeons in cities to be flying rats. It is forbidden to feed them, they are hunted by catching them into nets, giving them drugs to prevent their laying eggs or they are shot.

didactics of biology - biology instruction - observations - urban animals - birds - Czechoslovakia. 147309.

228. THIESSEN, H.:
Der Bau des Dünnearms, Untersuchungen am bautürlichen Objekt (The structure of the intestines. A study of original objects.)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 6, pp. 204-206.
Lit. 4, 7 figs.

A small piece of intestine from a slaughterhouse or from the local butcher can serve as an object for observations of the outer and inner structure of the intestine and mesentery. The author provides detailed information about microscopic and macroscopic observations in class.

didactics of biology - biology instruction - human biology - zoology - digestive tract - microscopy - observations - FRG. 147309.

229. TREITZ, P.:
Der Weisstorch - "Vogel des Jahres" 1984 (The White stork - The bird of the year 1984)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 8, pp. 286-287.

The author deals with the White stork and the fact that it is rapidly disappearing from West European countries. Observations of the migration and nesting of this bird have indicated that its population is constantly declining and in some places has already disappeared entirely. For this reason nature conservationists have made it the "Bird of 1984". The author describes its biology, ethology, the cause of the decline of its population (changes in the landscape, land reclamation, loss of food sources, long-distance transmission of electric current) and describes experiments which aim at changing the stork into a non-migratory bird and the possibilities of increasing its numbers.

didactics of biology - biology instruction - zoology - ornithology - observations - nature conservation - FRG. 147309.

230. Uchit shkolnikov priemam ratsionalnoy uchebnoy deyatelnosti (Teaching pupils methods of rational activities) Biologiya v shkhole, 58, 1984, No. 5, pp. 37-39.

The article describes various rational activities for pupils which they can do in the course of their learning. They concern the observations and descriptions of comparable phenomena, the formulation of experimental objectives, drawing up plans for observations and experiments, the selection of media and resources, work with literature. These instructions have been taken from a book by V.I. Andreev called "Heuristic Programming of Learning and Research Activities."

didactics of biology - biology instruction - methodology - observations - experiments - USSR. 147309.

9.8 Experimental method

231. **ALTMANN, A.:**
Několik školních pokusů k ochraně životního prostředí
(Several school experiments concerning environmental conservation)
Přírodní vědy ve škole, 35, 1983-1984, No. 7, pp. 252-253.

The author describes an experiment to demonstrate how various chemicals damage the environment. He cites two alternative experiments which demonstrate how salt used on icy roads harms the environment. The experiments can easily be carried out in class.

didactics of biology - biology instruction - environmental conservation - interdisciplinary relations - chemistry - experiment - Czechoslovakia. 147309.

232. **ANDREWS, I.:**
A simple way to show that carbon dioxide is needed for photosynthesis
The School Science Review, 65, 1984, No. 232, pp. 499-501. 3 figs.

The author provides information about an experiment which proves the necessity of the presence of carbon dioxide if photosynthesis is to take place. In contrast to traditional experiments on this topic he suggest an improved version, which can be done with very meager facilities in the laboratory. A substance which absorbs carbon dioxide is required.

didactics of biology - biology instruction - plant physiology - teaching method - experiment - Britain. 147309.

233. BERGMANN, H.H.:
Über die Verwendung des Kampffisches (Betta splendens) in ethological courses (On the use of the fighting fish (Betta splendens) in ethology teaching)
Der biologische Unterricht, 20, 1984, No. 2, pp. 42-6.
Lit. 36, 8 figs.

The fighting fish (Betta splendens) is one of the so-called labyrinth fish, which have auxilliary respiration. The author describes the biology, breeding, the influence of selection on breeding and the behaviour of this interesting fish, He also describes interesting experiments with a mirror, which can easily be done by pupils.

didactics of biology - biology instruction - teaching methods - experiments - fish - ethology. FRG. 147309.

234. BINAS, A.V.:
O povishenii effektivnosti demonstratsii i opitov. Botanika, V. klas (On improving the efficiency of experiments and observations. Botany, 5th class)
Biologiya v shkole, 58, 1984, No. 4, pp. 27-32.

The author describes the methodology of a demonstration experiment,how it should be prepared, carried out and analysed. The author recommends that demonstration experiments be combined with problem teaching. He cites the example of a demonstration experiment in botany teaching in the 5th class which is described in detail.

didactics of biology - biology instruction - teaching method - experiment - botany - 5th class - UdSSR. 147309.

235. CHISTOVA, K.N.:
Primerniye rozrabotki k provedeniyu opitov na shkolnikh uchebno-opitnikh uchastkakh (Model development of experiments on a school experimental plot of land)
Biologiya v shkole, 1984, No. 2, pp. 61-64. Lit. 7, 6 tabs.

The author describes the methodology of 6 experiments which can be carried out on a school plot of land, and provides instructions for preparing the experiments, analysing the soil, carrying out phenological observations, calculations, etc. The experiments concern the influence of fertilizers on a crop of peas, the influence of various planting methods on the barley crop, the influence of the time when planting is done on a buckwheat crop, factors which influence a maize crop, the influence of the depth of seed planting upon a sugar-beet crop and the influence of tracer elements on a sugar-beet crop.

didactics of biology - biology instruction - work on school plot of land - experiments - USSR. 147309.

236. DARYLL, J.:
Using mice in junior science
The School Science Review, 66, 1984, No. 234. pp.84-87. 2 figs.

The author provides instructions for carrying out ethological experiments with mice. He also provides basic information on how to breed, feed, and observe them. The experiments concern the movement of mice around the perimeter of their cage and their feeding habits. Also what type of cage to use and what to feed them is described in detail.

didactics of biology - biology instruction - zoology - ethology - experiment methodology - mammals - rodents - Britain. 147309.

237. EISENHABER, P.:
Die Erfahrungen der Schüler auch bei der Behandlung der Osmose beachten (Pupils' experiences should be taken into account, even when teaching about osmosis)
Biologie in der Schule, 33, 1984, No. 12, pp. 458-460.
1 fig.

Many pupils explain osmosis for themselves as the outcome of differences in pressure or they seek analogies with the way dry wood or a blotter will suck in water, which is in accord with their own experiences. Osmosis can be correctly understood by using a model made of filtered samples of soil solutions, a membrane made of "synthetic intestine" - for instance taken from a frankfurter, and a solution which has the same concentration as cellular fluid (for instance roots can be crushed and sugar and salt added). The frankfurter skin is connected to a glass pipette with a rubber stopper. During 20 minutes pupils can observe how the level of water in the pipette had gone up by as much as 20 cm.

didactics of biology - biology instruction - plant physiology - botany - experiments - GDR. 147309.

238. FOOTE, J.:
Thin Layer Chromatography (TLC) of Chlorophyll Pigments
The American Biology Teacher, 46, 1984, No. 4,
pp. 226-229. Lit. 10, 5 figs.

Chromatography is a rapid method for separating and identifying components found in a mixture, without destroying them. There are now various types of chromatography and various techniques used by this method. Its use is increasing and paper chromatography is now routinely used even by schools and in higher education. The author describes the history of chromatography methods and describes thin layer chromatography which is suitable for schools and has proven to be better than paper chromatography for studying chlorophyll pigments. This method is described in detail.

didactics of biology - biology instruction - plant physiology - chromatography - observations - experiments - USA. 147309.

239. GIBBY, M.:
Why is celery so stiff?
The School Science Review, 66, 1984, No. 235, pp. 307-308.
1 fig., 1 tab.

Experiments concerning the relationship between water and plant tissue are usually done with potatoes put into distilled water and into water solutions of various concentrations. Losses and additions to the liquid are then measured. The author describes an experiment where instead of water he uses celery.

which yields better results. He used slices of celery 5 cm long and Petri dishes. After 30 minutes the slices can be taken out of the solution, dried, weighed and otherwise measured. The findings are more convincing than with potatoes.

didactics of biology - biology instruction - plant physiology - experiments - observations - Britain.
147309.

240. GONOSCHOREK, R., ZUCCHI, H.:
Über den Einsatz des Axolotls (Ambystoma mexicanum) im Biologieunterricht (On the use of the axolotl (Ambystoma mexicanum) in biology instruction)
Der Biologieunterricht, 20, 1984, No. 2, pp. 28-41.
Lit. 40, 4 figs.

The authors describe the biology and breeding of the axolotl salamander and the criteria which should be used to chose an animal for breeding in school. If its use in school is not to decrease the number of these animals living in the wild, then it should be bred and multiplied in school. The authors consider this amphibian to be highly suitable for breeding in school. It was first discovered by Europeans in 1600, but was first brought to Europe in 1807 by Cuvier from his expedition to Mexico. Its original locality is the Lake Xocimilco, 25 kilometers south-east of Mexico City. The authors also describe the animal's morphology, metamorphosis, behaviour, breeding, feeding and diseases. The axolotl can be used in biology instruction in the 7 and 8th class and/or in the 9th and 10th class.

didactics of biology - biology instruction - observations - experiments - amphibians - Mexico - FRG. 147309.

241. GORBUNOVA, T.V.:
K metodike izucheniya osennogo listopada (On the methodology of teaching about the falling of leaves in the autumn)
Biologiya v shkole, 58, 1984, No. 4, pp. 46-49.

In elective courses on plant physiology the topic of periodic processes in the plant kingdom is studied. An interesting subject is the study of the autumnal shedding of leaves by trees and shrubs. On the basis of suitable experiments a correct notion of this process can be achieved. The experiments concern the extraction and classification of plant pigments, changes in the colour of anthocyanins caused by acids and other chemicals, measurements of the maximum loads of yellow or green pigment a leaf on the bough can sustain, a study of the influence of temperature on the speed of water absorption in root systems and other problems.

didactics of biology - biology instruction - botany - plant physiology - elective courses - experiments - chlorophyll - USSR. 147309.

242. FISCHER, R.L. - NOVAK, A.J.:
An Experimental Fish Ethology Unit
The American Biology Teacher, 46, 1984, No. 1, pp.28-30. Lit. 18, 4 figs., 2 photos, 4 tabs.

The authors describe ethological experiments. They use the fish Corydoras paleatus and study the behaviour of the fish Oryzias latipes. These experiments concern the role of light and temperature in the regulation of reproduction. Other experiments concern the behaviour of the fish Kryptopterun bicirrhus and deal with the influence of population density upon reproductive behaviour. In one experiment the male - female ratio is changed and its influence upon reproductive behaviour is studied.

didactics of biology - biology instruction - zoology - ichthyology - observations - ethology - experiments - aquarium - USA. 147309.

243. HESSE, M.:
Streusalz - Darstellung einiger experimenteller Daten und Schulversuche (Salting of roads - the processing of experimental data and school experiments)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 3, pp. 65-74. Lit. 10, 1 teaching material, 13 figs., 3 tabs.

The author describes how data concerning the damage done by salting of roads is processed, the effect of salting on trees in cities, the effect of salt on the growth and differentiation of various plants, the relationship between the structure and function of plants, the effect of chemicals on the environment, the use of salt for salting roads in FRG and on metal corrosion. Also data on positive and negative effects of salting on road traffic in the Federal Republic is provided.

didactics of biology - biology instruction - environmental conservation - urban greenery - road salting - experiments - FRG. 147309.

244. HILL, F.C. - HILLIER, D.:
The Nitrogen Cycle
The School Science Review, 66, 1984, No. 234, pp. 87-91.
1 fig. 1 outline.

The authors describe experiments which demonstrate the nitrogen cycle and the creation of proteins by symbiotic bacteria, such as r. Rhizobium, the decomposition of protein, its hydrolysis, the oxidation of ammonia, of nitrates and the creation of atmospheric nitrogen and the fixation of nitrogen by freely living bacteria. Separate experiments are described to illustrate various stages of the nitrogen cycle in plant physiology.

didactics of biology - biology instruction - nitrogen circulation - bacteria - proteins - nitrogen compounds - Britain. 147309.

245. KHANMAGOMEDOV, E.G.:
Kak mi organizuem opitnicheskuyu rabotu uchashchikhsya VII. - X. klassov v nashey shkole (How we organize experimental work by pupils in the 7th to 10th classes in our school)
Biologiya v shkole, 58, 1984, No. 5, pp. 61-66.

The author acquaints readers with the experimental and scientific work done by the pupils in the Murkatsk secondary school which is found near the high mountain ranges of Soviet Central Asia. On the basis of studying literature, obtaining data from the local Sovkhoz and on the basis of their own experiments, pupils were able to draw up a methodology for improving the quality of hay. The author also stresses the positive effect of fully utilizing interdisciplinary relations, specifically between biology and chemistry and the importance of adequately planning and then carrying out pupil experiments.

didactics of biology - biology instruction - experiments - agriculture - high mountains - socially beneficial work by pupils - USSR. 147309.

246. KETTWIG, U.:
Wandkontaktsuche bei Mäusen - Anmerkungen und Vorschläge zur unterrichtlichen Behandlung (Mice making contact with a wall - comments and suggestions for class work)
Der Biologieunterricht, 20, 1984, No. 2, pp. 4-27.
Lit. 15, 11 figs.

Mice have an inborn propensity to make contact with walls. This provides them with a cover and protection against enemies. The author provides various instructions and comments on experiments which concern this aspect of mice behaviour. The experiments are suitable for the 5th and 6th classes.

didactics of biology - biology instruction - experiments - ethology - vertebrates - rodents - FRG. 147309.

247. KITCHING, G.B.:
Chemical warfare amongst plants
The School Science Review, 65, 1984, No. 232, p. 499.

The author describes allelopathy, which leads to a situation where the product of leaching some plant substances in water is poisonous for other plants. The author explains this phenomenon and recommends its use in experiments in school.

didactics of biology - biology instruction - plant physiology - experiments - Britain. 147309.

248. KLAHM, G.:
Wie sauber noch ist die Duft in unserer Stadt ? Pflanzen zeigen den Zustand der Luft an (How clean is the air in our town? Plants indicate the state of the air)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 3, pp. 92-103. Lit. 18, 4 information sheets, 1 map, 2 worksheets.

The author describes urban air pollution sources, which include industry, traffic and households. The experiments described by the author deal with an analysis of automobile exhausts, the influence of sulphur dioxide on plants, as well as the effect of nitrates upon plants. Also a key for assessing the quality of the air is provided.

didactics of biology - biology instruction - environmental conservation - air pollution - botany - experiments - FRG. 147309.

249. KONERT, U.:
Ein Kugel - Simulationsexperiment zur Osmose (A ball - a simulation experiment on osmosis)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 11, pp. 348-349. 4 figs.

The author describes a model experiment which simulates osmosis on the basis of red and blue wooden beads and two plastic dishes. All relevant factors of osmosis are taken into account in this simulation experiment.

didactics of biology - biology instruction - physiology - osmosis - experiment. FRG. 147309.

250. KOPRASCH, G.:
Reagenzien für Schülerexperimente der Abiturstufe
(Reagents for pupil experiments in the upper classes of general education secondary schools)
Biologie in der Schule, 33, 1984, No. 3, p. 96.

The author cites various methods and ways of preparing the necessary chemicals which are required for pupil experiments. Most of them he acquires himself or with the help of pupils. Among the chemicals required are iodine solutions, Fehling solutions, Lugol solutions, methelyne blue, neutral red pigment, chlorine, zinc chloroiodine and others.

didactics of biology - biology instruction - chemicals - experiments - general education secondary school - PDR. 147309.

251. LIEB, E.:
Ein drosophilagenetisches Experiment zur Lokalisation von mutierten Genen (An experiment in genetics with fruit flies to locate gene mutation)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 9, pp. 270-282. Lit. 16, 6 information sheets, 10 figs.

The author describes a number of experiments which cross-breed the Drosophila melanogaster fly and aim at identifying and localizing gene mutations. The author describes the breeding of the fly, the creation of the required strain and how cross-breeding is carried out. This work is demanding as far as the causal thinking of pupils is concerned and is suitable for the upper classes of secondary school.

didactics of biology - biology instruction - general education secondary school - genetics - gene mutation - experiment - localization of mutation - insects - FRG. 147309.

252. MENZDORF, A.:
Ausgewählte Versuche zur Sinnesphysiologie (Selected experiments concerning the physiology of sensory organs)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 7, pp. 198-212.

The author deals with the physiology of the sensory organs, especially with mechanical receptors, chemical receptors, thermo-receptors, photo-receptors, electro-receptors and osmo-receptors. He discusses the physiological aspects of stimulation, the ion theory and Nachmansohn's hypothesis (according to which acetylcholine is responsible for changes in permeability). Experiments concern the escaping behaviour of frogs (Xenopus laevis) when stimulated by shaking and the Weber-Fechner law about the summation of stimulation. Other experiments deal with the optical and olfactory stimulation of frogs, their "sense" for assessing moisture(in the frog Bufo calamita),thermal and optical sensory organs in frogs. Final experiments concern sight sensors in humans.

didactics of biology - biology instruction - experiments - sensory organs - neurophysiology - FRG. 147309.

253. MEYER, H.:
Experimentelles Arbeiten im Biologieunterricht
(Experimental work in biology instruction)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 1, pp. 15-18.

The author provides information on a questionnaire project aimed at determining the situation in experimental work done during biology instruction in secondary schools in the FRG. The author is on the staff of the Educational Faculty at the University in Bonn, where he holds a seminar on the teaching of biology and on biology. The questionnaire provided information on the education of biology teachers, the conditions for biology teaching which exist in various schools and the amount of experimental work done by pupils. The findings will serve to improve the teacher training of future biology teachers.

didactics of biology - biology instruction - teaching methods - experiments - study project - FRG. 147309.

254. MITON, P.:
La reproduction et l´effect de groupe sur la reproduction des fourmis (Reproduction and the effect of the group on the reproduction of ants)
Biologie - Géologie, 71, 1984, No. 2, pp. 323-329.
4 figs.

The author describes the collection of ants, the founding of an ant hill in school, their hibernation and how to organize observations of the ants by pupils. He deals specifically with the Leptothorax nylander specie of ants.

didactics of biology - biology instruction - teaching method - experiment - observation - insects - ants - France. 147309.

255. MOLLOVA, S.T.:
Kachestveno opredelyane na vitaminite v lekarstveni rasteniya chrez khartiena khromatografiya (Determining the quantity of vitamins in medicinal herbs by paper chromatography)
Biologiya i khimiya, 37, 1984, No. 6, pp. 43-46.

The author describes suitable methods for determining the quantity of vitamins found in various medicinal plants by paper chromatography. The details of the work are described, all chemical equations are provided and the chemical, physical and other properties of vitamins are described. The author also describes suitable experiments which prove the presence of vitamins in various plants.

didactics of biology - biology instruction - teaching method - experiment - vitamins - medicinal plants - chromatography - Bulgaria. 147309.

256. NGUEN KUANG VIN:
Ispolzovanie opitov v obuchenii anatomii, fiziologii i gigiene cheloveka (Making use of experiments in teaching human anatomy, physiology and hygiene)
Biologiya v shkole, 58, 1984, No. 4, pp. 50-55.

The author reports on the findings of a study project among Vietnamese teachers concerning biology instruction which indicate that experiments are mainly used as a medium to illustrate new subject-matter. But in the process of forming notions, in strengthening what has been learnt, in the creation of problem situations and in their solution, as well as when acquainting pupils with the methodology of scientific work and verifying what pupils have learnt, experiments are used to a small extent or not at all. The author distinguishes experiments which aim at creating a problem situation, research experiments, experiments to verify pupils´ knowledge and skills, and others.

didactics of biology - biology instruction - teaching methods - experiments - human biology - hygiene - Vietnam - USSR. 147309.

257. MOREL, J.C. - MOLLO, P.:
Observation de la fécondation et des premiers etades de dévéloppement chez l´huitre (Observing the fertilization and first stages of development of the oyster)
Biologie - Géologie, 71, 1984, No. 1, pp. 115-116. 3 figs.

The authors provide instructions for school laboratories on how to fertilize and later observe the early stages of development of the oyster. Instruction for acquiring filtered sea water are given, as well as for openning the oyster, determining its sex with a microscope and then its artificial fertilization in water which is 25°C warm. Already after 40 minutes it is possible to observe whether the fertilization was successful. How development continues until the creation of a larvae after 5 to 10 hours is described in detail and a summary table is provided.

didactics of biology - biology instruction - teaching method - observations - experiments - fertilization - development, molluscs - France. 147309.

258. NORDBRING - HERTZ, B.:
The biology of a nematode-trapping fungus
Journal of Biology, 18, 1984,No. 1, pp. 21 - 24.
Lit. 15, 5 photos.

The author describes an interesting form of soil fungus which belong to the so-called nematode-trapping species. There are about 150 species of these fungi. The author describes their biology and simple experiments which can be done with them.

didactics of biology - biology instruction - zoology - botany - fungus - experiment - Britain. 147309.

259. POCOCK, L.:
Chick in school
The School Science Review, 66, 1984, No. 234, pp. 79-83.
6 figs.

The author describes the incubation of chicken eggs and the breeding of chicks in school. The incubator should maintain a steady temperature of 30 to 35 degrees Celsia and can easily be made of a box and lamp. Incubation takes 21 days and can be accompanied by various measurements of the eggs and their observation so that pupils can follow the development of the chicks.

didactics of biology - biology instruction - zoology - chicken eggs - incubation - experiments - observations - Britain. 147309.

260. RATHAM, R.:
Nachweisreaktionen für Alkaloide, Glykoside und Bitterstoffe (Reactions to prove the presence of alkaloids, glycosides and bitter substances)
Praxis der Naturwissenschaften, 33, 1984, No. 3, pp. 87-90.
Lit. 5, 4 figs.

The author describes suitable school experiments to provide proof of the presence of alkaloids, glycosides and bitters. He also describes the subject-matter of these experiments and the topics with which they are connected, which are in the teaching syllabus for the upper classes of secondary school. Alkaloids can be demonstrated in the Deadly nightshade (Atropa belladonna), bitters in the roots of the Gentian and glycosides in the Foxglove (Digitalis purpurea). It is interesting to compare the glycoside content of various species of Foxglove (Digitalis purpurea, Digitalis lutea and Digitalis grandiflura).

didactics of biology - biology instruction - biochemistry - medicinal herbs - poisonous herbs - FRG. 147309.

261. REISS, J.: Gewinnung von Metallen durch Bakterien. Versuche zum Leaching. Verfahren im Biologieunterricht
(Obraining metals from bacteria. Experiments with leaching procedures in biology instruction)
Der mathematische und naturwissenschaftliche Unterricht, 37, 1984, No. 3, pp. 156-160.
Lit. 14, 6 figs.

The Federal Republic is the third greatest consumer of metals in the world and most of the metal ore it uses is imported. For this reason new methods are being studied for also making use of ores with a small metal content. A new method has recently been developed, which is called leaching and which makes use of chmolithoanthotropic bacteria of the Thiobacillus specie which obtain their carbon from carbon dioxide. The relevant strains are called Thiobacillus ferrooxidans and Thiobacillus thiooxidans. The author describes the principles of leaching metals with the help of these bacteria and also simple experiments which can be done within the framework of biology teaching in secondary school.

didactics of biology - biology instruction - metal leaching - bacteria - experiment - FRG. 147309.

262. SCADDING, S.R.:

Thyroxine induced resorption of Xenopus laevis tail tissue in vitro

Journal of Biological Education, 18, 1984, No. 1, pp. 82-84.

Lit. 8, 2 figs., 2 tabs.

The author describes a simple method for studying the resorption of a frog's tail tissue in vitro, induced by thyroxine. Demonstrations of this kind show that resorption depends on thyroxine and required protein synthesis. The author also describes how students were able to master the skills required for the experiment and the findings they obtained.

didactics of biology - biology instruction - zoology - physiology - hormones - experiments - amphibians - Britain. 147309.

263. SCHEEL, H.:

Feststellung der Schneckfähigkeit für phenylthioharnstoff - ein Test zur Veranschaulichkeit eines monogenen, autosomal - dominanten Ergangee beim Menschen

(Determining the ability to taste phenylthiourea - a test to demonstrate monogenic, autosomal, dominant heredity in man)

Biologie in der Schule, 33, 1984, No. 1, pp. 18-22.

3 figs., 1 tab.

In teaching genetics it is important that pupils, besides learning the theory, should be able to carry out simple tests to demonstrate the existence of heredity in man. A suitable object for this purpose is the ability to taste phenylthiourea (PTM), a compound which A.L. Fox discovered in 1931. He found that some people perceive this substance as bitter and others do not. It can be made of a 0.2 % solution of PTM in 96 % alcohol which is then put on some filtration paper. Each pupil is given a square centimeter of this moist filtration paper, which is put on the pupils´s tongue and he then reports whether he tastes bitterness or not. The ability to perceive PTM is inherited dominantly and autosomally; the respective allels are marked T and t (the inability to perceive PTM), Possible combinations for the reconstruction of a family tree are the following:

TT x tt (all in the F_1 generation tasted PTM)
TT x tt (dtto)
Tt x Tr (progeny are tasters and non-tasters at a ratio of 3:1)
tt x tt (all in the F_1 generation are non-tasters).

The situation is complicated by the fact that the ability to taste PTM is also an example of physiological polymorphism (not all persons can perceive bitterness in the same way) and depends upon the concentration of PTM. Primates also have this ability. Studies are under way to establish relations between the ability to taste PTM and various disease (diabetes, caries, schizophrenia).

didactics of biology - biology instruction - physiology - sensory perception - human biology - genetics - teaching method - experiment - GDR. 147309.

264. SCHWART, E.:
Die Bestimmung der Saugkraft pflanzlichen Gewebe mit Schulschen Mitteln (Determining the suction capacity of plant tissues with means available in schools)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 4, pp. 117-127. Lit. 9, tab. 8, 1 teaching material, 6 figs.

The author provides the outline of a 6 lesson teaching unit which deals with various aspects of diffusion in plants, the speed of diffusion, osmosis, plasmolysis, determining the suction strength of plants and how ions overcome membranes.

didactics of biology - biology instruction - experiment - plant physiology - general biology - FRG. 147309.

265. SPAE, H.:
Modellversuche zur biologischen Selbstreinigung stehender Wasser (Model experiments with the biological self-cleansing of stagnant water)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 3, pp. 75-81. Lit. 5, 4 figs., 2 models for copying, 1 tab.

Experiments with the break-down of pepton demonstrates organic loading and also the biological self-cleansing capacity of stagnant water. This experiment is long-term, it requires 4 to 6 weeks. The content of O_2, SH_2 and NH_4 are measured. The aim of the experiment is to provide a topic which pupils can work on independently, describe its course and provide a biological explanation of the self-cleansing ability of stagnant water. When water pollution is small, self-cleansing will take place rapidly, but when pollution is more extensive self-cleansing slows down or breaks down altogether. A list of micro--organisms which contribute to self-cleansing is provided.

didactics of biology - biology instruction - water pollution - self-cleansing capacity of water - experiment - FRG. 147309.

266. SVENSHCHAROV, G.:
Kloning kato metod na poluchavane na "izkustveni" bliznaci (Cloning as a method of obtaining "artificial" twins)
Biologiya i khimiya, 27, 1984, No. 1, pp. 13-17.

The author describes experiments with the implantation of the nucleus of a somatic cell from a higher organism into the egg cell of another individual of the same specie. These experiments have been successfully carried out with fish and amphibians. By this method it is possible to obtain series of clones of an individual with the same characteristics. Recently similar experiments have also been successful with mice. In the USSR scientists are studying the possibility of implanting the nucleus of a mammoth cell which had been preserved by frost, into the egg cell of a contemporary female elephant. Perhaps a live mammoth will develop.

didactics of biology - biology instruction - experiment - implantations - cloning - Bulgaria. 147309.

267. Tradescentia, ein Bioindikator für Radioaktivität
(Tradescentia - a bioindicator for radioactivity)
Praxis der Naturwissenschaften - Biologie, 33, 1984,
No. 7, pp. 221-222.

Students have been successful in experimentally proving the existence of radioactive emissions from the nuclear power plant on the Lower Weser with the help of Tradescentia, a decorative plant. This was discovered by the students at the University of Bremen. Tradescentia is sensitive to ion radiation, to which it reacts by gene mutations. Verification has, however, indicated that this plant is not generally very suitable as a dosimeter for environmental conservation in the vicinity of nuclear power plants.

didactics of biology - biology instruction - radioactivity - plants - experiments - environmental conservation - nuclear power plants - FRG. 147309.

268. WEBB, P.J.:
Blood separation
The School Science Review, 65, 1984, No. 232,
pp. 506-508. Lit. 3, 2 figs.

The author describes blood separation in which red blood cells, white blood cells and plasma are separated. Special chemicals are used for this purpose (phosphate buffered saline-PBS) and a lymphocyte separation environment made by Flow Laboratories, Irvine, Scotland. This method greatly improves upon classical blood separation techniques, where the leucocytes cannot be seen. This experiment can be done in the upper classes of secondary school or in college.

didactics of biology - biology instruction - human biology - experiment - human blood - Britain. 147309.

269. WEISHEIT, K.:
Gedanken zur Einführung der experimentellen Methode im Biologieunterricht (Comments on the introduction of the experimental method into biology instruction)
Biologie in der Schule, 33, 1984, No. 1, pp. 23-25.

When pupils are introduced to the experimental method in biology instruction, it should be explained to them that this method is very important for all the natural sciences. The author approaches a discussion on experiments done in the 5th and 6th classes from this point of view. She illustrates the practical implementation of this method on the basis of demonstrating the presence of starch in bean seeds and of fats in the fruit of some plants. Stress is placed on a uniform arrangement of experimental protocols.

didactics of biology - biology instruction - experiments - botany - 5th and 6th class - protocols - GDR. 147309.

10. Biology instruction media

270. CROVELLO, T.J.:
Evolution of Educational Software
The American Biology Teacher, 46, 1984, No. 3,
pp. 140-145. Lit. 8, 2 photos.

The author discusses the history and contemporary situation in educational software available for macro and micro computers in schools. He stresses the importance that computers have gained in high schools and colleges. Students have learnt how to use computers and thus substantially ease the work of the teacher, especially in college. The evolution of software will continue more rapidly than in preceding years and we can expect higher quality computer programs for instruction. Nevertheless, the role of the teacher will continue to be of key importance for the quality of education.

didactics of biology - biology instruction - teaching media - computers - software - USA. 147311.

271. Gotovyatsya k serinomu vipusku noviye sredstva obucheniya
(New teaching media are being prepared for large scale production)
Biologiya v shkole, 58, 1984, No. 5, pp. 54-55.
2 photos.

The enterprise Priroda i shkola (Nature and School) has produced new teaching media. Among them are collections of insects called "Pests of important crop plants", a collection for the topic "The classification of plants and animals" and also a collection of gardening tools for pupils.

didactics of biology - biology instruction - teaching media - collections for schools - gardening tools - USSR. 147311.

272. SZYLARSKA, E.:
Z badań wdrożeniowych nad środkami dydaktycznnymi w klasie VIII (Research findings concerning teaching for the 8th class)
Biologia w szkole, 37, 1984, No. 4, pp. 228-233.
2 tabs.

The purpose of the study reported on was to obtain information about the teaching media used in the 8th class of basic school. The author provides a survey of these media, baginning with original objects, diagrams, instruments for laboratory work and projection and sound reproduction technology. She also informs readers about plans to produce new teaching media.

didactics of biology - biology instruction - basic school - 8th class - study project - Poland. 147311.

273. SHILOV, V.F.:
Ob ispolzovanii uchebnogo oborudovaniya po fizike v protsesse prepodavaniya biologii (On the use of teaching media used for physics instruction in biology instruction)
Biologiya v shkole, 58, 1984, No. 2, pp. 52-54.
2 figs., 1 tab.

The author stresses that interdisciplinary relations concern not only notions and knowledge, but also the utilization of teaching media from other subjects. On the basis of a study of how physics teaching media are used, the author shows that this use improved pupils'interest and motivation. The greater part of the article is devoted to a description of biological experiments in which physics teaching media are used.

didactics of biology - biology instruction - interdisciplinary relations - physics - teaching media - USSR. 147311.

10.2 Original live objects

274. DONATH, H.:
Libellenals ökologische Untersuchungsobjekte
(Dragonflies as ecological study objects)
Biologie in der Schule, 33, 1984, No. 11, pp.428-431.
3 tabs.

Within the framework of hobby club activities, pupils often deal with problems of water conservation and study this problem. This has a number of advantages, because ecological relations in a water environment are easier to understand than under terrestrial conditions. Dragonflies (Odonata) are suitable as indicators of water pollution. They are found in a small number of species and so are not difficult to identify, they are easy to find outdoors, many can easily be caught and then observed in an aquarium. Most of them have very definite demands upon their environment. The author analyses the ecological relationship between them and various types of water and provides a key to Dragonfly species and the degree of water pollution. He also distinguishes those that live in flowing waters, in lakes and in peat bogs.

didactics of biology - biology instruction - original objects - water pollution - environmental conservation - insects - GDR. 147311.

275. HINTERMEIER, H.:
Lebende Amphibien im Unterricht. Eine Übersicht über die gesetzlichen Bestimmungen der einzelnen Bundesländer
(Living amphibians in instruction. A survey of legal norms in various parts of Germany)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 3, pp. 105-109. Lit. 7, 2 figs.

Amphibians are protected by law in the Federal Republic. As a consequence of this situation the traditional use of amphibians as original objects in school is very limited. In some of the Bundesländer, however, catching amphibians for the purposes of teaching is permitted. The author cites the relevant legal norms concerning this problem and provides various recommendations.

didactics of biology - biology instruction - original objects- nature conservation - legal aspects - FRG. 147311.

10.2.4 Aquariums, micro-acquariums, terrariums, aqua-terrariums

276. RUD, N.P.:
Akvarium v period shkolnikh kanikul (The aquarium during the school holidays)
Biologiya v shkole, 58, 1984, No. 3, pp. 72-73.

The author discusses the problem of caring for a school aquarium during holidays. Usually the situation is dealt with by volunteers. While the plants survive this care, it is often necessary to acquire new fish. The author suggests a solution by a better choice of aquarium fish and recommends species which are less dependent upon feeding. Animals which feed on detritus can also be put in the aquarium. The author provides a list of plant and animal species which will not be harmed by the period of school vacation.

didactics of biology - biology instruction - original object - acquarium - school holidays - USSR. 147311.

10.2.6 Breeding animals in school, breeding facilities, collection of animals. Calendars for collecting fauna

277. BERG, L.:
Klein-Aquarienanlage - von Schülern nachbauer
(A set of small aquariums - with which pupils can work)
Biologie in der Schule, 33, 1984, No. 5, pp. 189-190.
3 figs.

When discussing aquariums the author comes to the conclusion that the best results are achieved with sets of small aquariums which can be used for different purposes. In the 5th class for fish, in the 6th class for Coelenterata, Flathelminthes, leeches, worms, water fleas and copepods, as well as for the cultivation of some plants, algae and waterweeds which are in the 7th class teaching syllabus. The author describes the making of a wooden frame for these small aquariums and how they should be glued together.

didactics of biology - biology instruction - aquariums - fish - aquatic fauna - GDR. 147311.

278. Budete pěstovat zlatohlávky (Breed Rose chafers)
ABC mladých techniků a přírodovědců, 28, 1983-1984,
No. 20, p. 19.

The author describes how pupils can breed the Rose chafer (Pachnoda marginata) insect. It can be kept in an aquarium with a temperature between 25 to 30 degrees Celcius, which can be provided by a 25 W bulb, which is lighted for 10 to 18 hours every day. The aquarium should be covered by a perforated lid. The development, food and habits of the insect are described and the opportunities it provides for school biology instruction.

didactics of biology - biology instruction - breeding insects - zoology - Czechoslovakia. 147311.

279. Labyrintky (The labyrinth fish)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 21, pp. 6-7, 4 pages appendix.

A number of fishes, such as the fighter fish, paradise fish, gourami and purring gourmani are among the labyrinth fish which have an auxiliary respiration organ developed by the extention of the gill arches. The author describes the biology, ethology and development of the Climbing perch from the Anabantidae family. This subject matter is suitable for biology hobby clubs.

didactics of biology - biology instruction - ichthyology - aquarium - Czechoslovakia. 147311.

280. NEEF, W.:
Fische im Gewächshaus - Baustein einer Naturwerkstatt, Arche und Permakultur (Fishes in a greenhouse - the cornerstone of a living nature complex - Arks and perennials)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 6, pp. 183-188. 9 figs.

A greenhouse full of plants can also be used to keep an aquarium and the whole complex can be used as an eco-system for ecological experiments. The author describes the breeding of the tropical fish Tilapis in a greenhouse and the various uses he made of the fish and the tropical plants for teaching purposes.

didactics of biology - biology instruction - aquarium - greenhouse - tropical ecosystem - FRG. 147311.

281. Ryby našich akvarií (The fish in our aquariums)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No.7, p. 7 + 2 page appendix, 8 photos

The author describes the breeding of a South American tropical fish (Callichthydae) which has beautiful colours. The eggs are glued to the glass of the aquarium or to leaves and a nest of foam is built. The fish requires water which is 28 degree Celsius warm. Various strains of this fish are described.

didactics of biology - biology instruction - aquarium - tropical fish - Czechoslovakia. 147311.

282. TOLOCHKI, E.I.:
Korma dlya shkolnoy fermi (Fodder for a school farm)
Biologiya v shkole, 58, 1984, No. 4, pp. 62-64.

Some boarding schools, homes for children and schools in rural areas have their own small animal farms. They face the problem of obtaining good quality fodder. The author recommends some plants which give high crop yields and which are simple to cultivate. Specifically he cites the chufa nut (Cyperus esculentus) and Jerusalem artichoke (Helianthus tuberosus) which have been chosen for this purpose in view of the climate in various areas of the USSR. A brief description of these species is given and also how they are cultivated and stored.

didactics of biology - biology instruction - breeding animals - fodder - botany - USSR. 147311.

10.2.6.1 Zoological gardens

283. FELIX, J.:
Problémy pražských tučňáků (The problem of Prague´s penguins)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 25, pp. 24-25. 2 photos.

Pupils´ attention is usually drawn to the penguins when they visit the Prague zoological gardens, which have been very successful in breeding these birds. The majority are the Humboldt penguins from the eastern coast and off shore islands of Chile and Peru. Breeding them is very difficult, the chicks are threatened by a lung disease caused by the Aspergillus fungus. The author describes other aspects and problems of breeding these birds in our climate.

didactics of biology - biology instruction - original objects - breeding animals - zoos - excursions - birds - Czechoslovakia. 147311.

284. JANALÍK, F.:
Děkujeme za pěkný zážitek ! (Thank you for a wonderful experience)
Krkonoše, 17, 1984, No. 6, pp. 14-15.

The small zoological garden found in the town of Vrchlabí in the Krkonoše foothills is highly suitable for school excursions. It is combined with a park and a science trail and is found in a beautiful environment. The zoological garden specializes in the fauna found in the Krkonoše mountains or that which no longer lives in the wild, where it has become extinct. It thus serves for the nature conservation of these popular mountains. The zoo has 350 to 400 species of animals.

didactics of biology - biology instruction - breeding animals - zoos - nature conservation - mountains - Czechoslovakia. 147311.

285. JESSOP, R.M.:
The Norfolk Wildlife Park
Journal of Biological Education, 18, 1984, No. 1, p. 16.

The Norfolk Wildlife Park is at Great Witchingham near Norwich. It contains the largest European collection of mammals and birds from the whole world. The Park was opened in 1961 by Philip and Jeanne Wayer. The author describes the animals kept there and the significance of the zoo for schools.

didactics of biology - biology instruction - breeding animals - zoos - excursions - mammals - birds - Britain. 147311.

286. JESSOP, R.M.:
The Otter Trust
Journal of Billogical Education, 18, 1984, No. 1,
pp. 17-18, 2 photos.

The Otter Trust was founded by Philip and Jean Wayer in 1971. The largest collection of otters is now found at River Farm in Earsham near Suffolk (founded in 1975). The article describes the situation of otters in Europe, their conservation and population. Nature conservationists have found that otter bodies concentrate larger quantities of dangerous chemicals, which are soluble in fats. Through the food chain they enter the body of predators and eventually destroy them. The use of chemicals has led to a decline in the otter population. Also the regulation of rivers and land reclamation work, together with water sports on a large scale have had a negative effect on the otter. The author describes steps taken throughout the world for the conservation of the otter, its study, breeding in captivity and re-introduction into the wilderness.

didactics of biology - biology instruction - animal breeding - mammals - nature conservation - Britain.
147311.

287. KUS, E.:
Hřeoci na služební cestě. (Stallion on a visit)
ABC mladých techniků a přírodovědců, 28, 1983-1984,
No. 15, pp. 24-25. 1 photo.

In 1932 the Prague zoological gardens obtained a pair of Przewalski's horses. In 1947 the last wild horse of this breed was caught. In 1959 a seminar was held about the conservation of Przewalski´s horse. At that time all the zoological gardens in the world had a total of 56 horses. In 1959 there were 159 of them and in 1976 already 253. By 1983 there were already 500 Przewalski horses. The Prague zoological garden has made an important contribution of the best Prague stallion Bars to foreign zoological gardens. The breeding of horses from various zoological gardens is important so that degeneration does not take place as a consequence of in-breeding.

didactics of biology - biology instruction - breeding of animals - zoos - mammals - Czechoslovakia. 147311.

288. KUS, E.:
Klasická zoo nebo safari ? (A classical zoo or safari?)
Věda a technika mládeži, 28, 1984, No. 3, pp. 83-84.
3 photos.

The public is constantly more interested in zoological gardens. In Czechoslovakia zoological gardens are visited by 4 million persons annually and in some countries the number of visitors is equal to one fifth of the population. The author describes the history of zoological gardens, beginning with ancient Egypt, China, Assyria and Rome. The first safari type zoo was founded by the German zoologist Hagenbeck. A modern safari zoo which specializes in African fauna can be found at Dvůr Králové in Czechoslovakia. In the author´s opinion classical zoological gardens are better from the point of view of providing education for visitors.

didactics of biology - biology instruction - zoos - breeding animals - excursions - Czechoslovakia. 147311.

289. MÖLLE, P. - SPIELER, S. - MATZKE, M.:
Objekte zoologischer Gärten als biologische Unterrichtsmittel in Festigungs- und Systematisierungsstudien
(Facilities in zoological gardens as biology instruction media in lessons devoted to strengthening and systematizing subject-matter)
Biologie in der Schule, 33, 1984, No. 4, pp. 138-140.
3 figs.

Lessons devoted to strengthening and systematizing what has been learnt, which are held in a zoological garden, make it possible to utilize knowledge from the point of view of general biology. For instance such aspects of zoology as the unity of structure and function and the unity of the organism and its environment lend themselves very well to this type of lesson. Pupils should also be able to apply knowledge concerning the phylogeny of organisms (evolutionary progress and regression, specialization and others). The author cites a number of pupil assignments related to these problems. One such assignment requires the pupil to compare the structure of the human body with that of a orangutan and various orders of birds.

didactics of biology - biology instruction - zoological gardens - comparisons - generalizations - phylogeny - general biology - GDR. 147311.

290. SANDFORD, F.:
Modern Zoos, New Challenges, New Responsibilities
The American Biology Teacher, 46, 1984, No. 1, pp. 31-35.
Lit. 15.

Opinions concerning the purpose and significance of zoological gardens are changing. At first they served for the recreation of the public, now they are considered to be important educational facilities with a specific role in nature conservation, because they preserve threatened species and make possible their re-introduction into the wilderness. The author describes the experiences of various zoological gardens and considers the San Diego, California zoological gardens to be a model of a modernly conceived educational zoo.

didactics of biology - biology instruction - zoological garden - nature conservation - educational role - USA. 147311.

291. TRPÁK, P.:
Ohrožené druhy živočichů (Threatened species of animals) Věda a technika mládeži, 1984, No. 20, pp. 622-625. 2 photos.

The author analyses the causes of why some animals are threatened with extinction in Czechoslovakia. Teachers will welcome a brief survey of ecological terms which the author provides. He also provides examples of the successful breeding of threatened animals and the positive results this brings.

didactics of biology - biology instruction - breeding animals - nature conservation - predators - Czechoslovakia. 147311.

10.2.7 Cultivating plants, hydroponics

292. Dekorativniye svoystva dreveshnikh porod (The decorative qualities of woody species)
Biologiya v shkole, 58, 1984, No. 2, pp. 67-69.

The article is a reprint of the introductory chapter of a book by A.P. Odintse called Dendrology for Gardens. The editors of the journal recommend that all those who want to plant woody species in the vicinity of schools or dormitories for youth and want to make the environment healthier and more aesthetical should study this chapter. The problem of selecting decorative woody species is discussed and what use they can be put to.

didactics of biology - biology instruction - cultivation of plants - decorative species - woody species - USSR.
147311.

293. DUNDA, K.:
Co nevíte o cukrovce. Pěstování cukrovky bez motyčky
(What you don´t know about sugar beets. Cultivating sugar beets without hoes)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 7, pp. 4-5. 2 figs.

Sugar beet has been cultivated for more than 150 years. At the beginning it had only 5 % sugar, but after selection it now has 18, 21 or even more percent. It is our most productive crop plant. A single plant has a very large leaf area, 5 to 6 thousand square centimeters. The author describes the origins of the plant, how it is cultivated from seeds in a traditional manner and also modern methods of cultivation which have greatly increased productivity of labour and made possible the mechanisation of cultivation and decreased the drugery which was always associated with this plant. Information from the article can be used for improving motivation in botany instruction in the 5th class.

didactics of biology - biology instruction - crop cultivation - botany - sugar beets - Czechoslovakia. 147311.

294. GILL, J.A. - HOLT, C.H.:
The automatic college greenhouse
Journal of Biological Education, 18, 1984, No. 1, p. 12. 1 fig.

The authors describe an inexpensive irrigation system for use in a greenhouse which has capillaries for constant deliveries of moisture and can be used in larger structures, as well as small ones.

didactics of biology - biology instruction - crop cultivation - botany - irrigation - automatic greenhouse - Britain. 147311.

295. HARCUBOVÁ, L.:
Jak pěstovat lomikameny ve skalce? (How can Rockbreakers be cultivated in an Alpine garden?)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 12, pp. 18-19. 3 photos.

The author describes opportunities for cultivating Rockbreakers or Garden saxifrages (Saxifraga sp.) in an Alpine garden. She describes various species and strains of this flower, which is propagated by cutting or from seeds, as well as by separating tufts. This knowledge can be made use of during work on a school plot of land. The plants come from the high mountains and have very specific requirements for soil and site.

didactics of biology - biology instruction - botany - Alpine garden - flower cultivation - Czechoslovakia. 147311.

296. Jak pěstovat brambořík ? (How to cultivate cyclamens) ABC mladých techniků a přírodovědců, 28, 1984, No. 14, pp. 18-19. 2 photos.

Cyclamens contain cycleman glycoside and other poisenous substances. Pigs are not harmed, however. In English the name sowbread is also used, because pigs eat the tubers of this flower. There are about 50 species of this genus. In Czechoslovakia Cyclamen europeum grow wildly and the Persian cyclamen is cultivated as a decorative potted plant. The author describes their cultivation.

didactics of biology - biology instruction - botany - decorative flowers - potted plants - Czechoslovakia. 147311.

297. Jak pěstovat melouny a tykve (How to cultivate watermelons and pumpkins)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 22, pp. 18-19. 5 photos.

The author describes the cultivation of various strains of watermelon and pumpkins, which both belong to the cucurbitaceous species of the Cucubita genus. This information can be made use of on a school plot of land.

didactics of biology - biology instruction - botany - vegetables - crop cultivation - school plot of land - Czechoslovakia. 147311.

298. Jak se pěstuje plamének ? (How is clematis cultivated?)
ABC mladých technicků a přírodovědců, 28, 1984, No. 8, p. 18, 4 photos.

Clematis requires a lot of sunshine, but the roots require shade and a cool place. This is a climbing plant and many species have large, colourful flowers. When planting clematis, a hole at least a half a meter deep should be dug. Various strains of this decorative plant are described.

didactics of biology - biology instruction - botany - decorative plants - plant cultivation - Czechoslovakia. 147311.

299. **KAPRANOVA, N.N.:**
Kak podobrat i razmestit rasteniya tropicheskoy i subtropicheskoy flori v kabinete biologii (How to obtain tropical and subtropical plants for the biology study room and where to place them)
Biologiya v shkole, 58, 1984, No. 3, pp. 66-71.
3 figs.

The author describes the possibilities for cultivating tropical and subtropical plants in a biology study room. She suggests two alternative collections, one which requires lots of moisture and another which does not and includes primarily cacti and other plants which grow in arid areas. The first collection includes 20 species, including ferns and gymnosperms and the second includes 27 species. The systematic identification of the plants is provided, as well as their place of origin and morphology. Also how to cultivate them and the opportunities they provide for botany instruction are discussed.

didactics of biology - biology instruction - botany - living nature room - tropical plants - subtropical plants - USSR. 147311.

300. Kultivace plísní (The cultivation of mould)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 19, pp. 18-19. 8 photos.

The cultivation of mould in Petri dishes is described. An autoclave should be used and the substrate sterilized. Also synthetic cultivating mediums are described and how to proceed to obtain good results. The result of the cultivation as well as the cultivation process itself can be used in biology instruction.

didactics of biology - biology instruction - cultivation of plants - botany - mould - Czechoslovakia. 147311.

301. LUKAVSKÝ, J.:
Chorella - řasa pro vesmír (Chorella - an algae for space)
ABC mladých techniků a přírodovědců, 28, 1983-1984, pp. 4-5, 6 figs.

There are 30 000 specie of algae. The phylum Chlorophyta includes the order of unicellular green algea Chlorococales which has 15 fresh-water species. The author describes how to identify them, how to cultivate them, isolate them for cultivation and their very rapid growth, especially of Chorella. Its biomass doubles within 8 hours. Its use in industry is described. Chorella is cultivated as a source of proteins. Its dry matter contains 50 % protein, while with wheat this figure is only 13 %. The present situation in the cultivation of algea throughout the world is described. It is also one of the experimental plants used in space flights. This is interesting subject matter which is suitable for botany courses both in basic and secondary school.

didactics of biology - biology instruction - algea cultivation - botany - Czechoslovakia. 147311.

223

302. MIKHALEV, I.P.:
Ya rabotayu volshebnikem (I work as a magician)
Biologiya v shkole, 58, 1984, No. 1, pp. 53-56.
4 photos.

The author here has in mind "magic" in the transformation of nature. He concentrates on the training of specialists in fruit cultivation. The secondary apprentice training center for orchard specialists accepts only pupils who have graduated from a ten-year general education school and who have good marks in biology, physics and chemistry, as well as in the foundations of agriculture. The author describes such an apprentice training centre in Moscow, its curriculum, teaching syllabi, facilities, greenhouses and how apprentices do practical work.

didactics of biology - biology instruction - fruit cultivation - secondary apprentice training centre - USSR. 147311.

303. MOLAS, J.:
Kultury wodne (Water cultures)
Biologia w szkole, 37, 1984, No. 3, pp. 183-185.

The author describes a project for teaching plant physiology which is very important. Plants are cultivated in school in a water medium. Mineral nutrients, which include both macro and microelements are added to the water. Detailed instructions for founding such plant cultivations are given and detailed instructions on how to diagnose when specific nutrients are lacking.

didactics of biology - biology instruction - plant cultivation - cultivation in water media - Poland. 147311.

304. NEWMAN, S.M.:
A precision multiple seed planter
Journal of Biological Education, 18, 1984, No. 1, p. 11, 2 figs.

The author describes the design of an inexpensive multiple seed planter and includes a drawing. The plate of the planter makes it possible to plant seeds on an area of 60 cm^2 with distances between single seeds 3, 4 and 5 cm, so that this area will take 1125, 711 or 469 seeds.

didactics of biology - biology instruction - crop cultivation - seed planter - school plot of land - Britain. 147311.

305. PEČONKA, B.:
Začínajícím kaktusářům (For beginner cacti cultivators)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 11, pp. 18-19. 4 photos.

The author provides information for the cultivation of cacti and how a beginner can obtain seeds (he specifically describes the Rebutia specie), plant them, how to maintain a temperature of 20 to 25 degrees Celsius, how to disinfect the culture to protect it against algae (with a weak solution of potassium permanganate), how to prepare suitable soil (1 part peat, one part washed sand and one part leaf material) and how to install a drainage system in the soil. The cacti are watered with distilled water and a cultivating medium. The article is suitable for use in hobby club activities.

didactics of biology - biology instruction - hobby club activities - succulents - cultivating cacti - Czechoslovakia. 147311.

306. POKORNÝ, M.:
Krása z květináče (Beauty from a flower pot)
Věda a technika mládeži, 38, 1984, No. 9, p. 274.
3 photos.

The author describes the history of coffee cultivation, its present situation and he explains how coffee can be cultivated on a window sill. The article can be used in hobby clubs in the 5th class of basic school. Coffee plants require dry air and temperatures around 20 °C. The temperature must never fall below 5 °C. The soil should be slightly acid, it should not be limed. Fertilisers used for indoor plants can also be used for this plant. The plants should not be exposed to direct sunlight. The tip of the plant should be cut off so that a shrub develops. After five years one shrub, about 1 meter high, will produce about one pound of coffee.

didactics of biology - biology instruction - hobby club activities - 5th class - botany - cultivating tropical plants - Czechoslovakia. 147311.

307. RUSAKOV, S.M.:

Kak vyrastit tsvetochnuyu rassadu v shkolnoy teplice
(How to cultivate flower seedlings in a school greenhouse)
Biologiya v shkole, 58, 1984, No. 2, pp. 65-66.

The growth and cultivation of seedlings which are then re-planted to grow flowers and vegetables depends on the quality of the soil found in the greenhouse. It should contain a sufficient amount of nutrients, have good physical and chemical properties, be adequately moist and aerated. The author also describes in detail how to prepare the soil in a greenhouse, when seeds should be planted, seedlings replanted and other related problems.

didactics of biology - biology instruction - botany - school greenhouse - care of soil - USSR. 147311.

308. THOMPSON, R.E.:

Growing mushrooms as a school project
The School Science Review, 65, 1984, p. 232, pp. 498-499.

In Britain the annual value of cultivated mashrooms is 50 million pounds sterling. The author provides instructions on how to cultivate champignons in school. An annual crop of 5 to 10 kiles of mushrooms from one square meter of soil can be achieved.

didactics of biology - biology instruction - cultivation of mashrooms - fungi - Britain. 147311.

309. TRUHLÁŘ, V.:

Jak pěstovat citrusy (How to cultivate citrus fruits) ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 6, pp. 18-19. 2 photos.

Citrus plants are evergreen woody species found in the tropics and subtropics. Some are self-pollinating, some require pollination and some are parthenocarpic, which means that they do not require any pollination. Some of them bloom several times a year. They provide fruit rich in vitamins, valuable wood, aromatic blooms and leaves (for teas) and the peel of the fruits is used in the pharmaceutical industry and in candy making. The seeds can be pressed for oil. When seeds are planted, the fruits produced are not of good quality and take 8 to 12 years to produce. Seedlings have to be grafted for good quality fruit. The author provides information about where more information on the cultivation of citrus trees can be obtained.

didactics of biology - biology instruction - cultivation of tropical plants - citrus fruits - Czechoslovakia. 147311.

10.2.7.1 A school plot of land, botanical gardens, young natural scientist stations, school biology centres, school forestry areas, scientific trails

310. *Arboretum malé, ale pěkné* (A small but nice arboretum) ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 22, p. 19. 1 photo.

The editors of the magazine recommend a school excursion to the arboretum found at Bílá Lhota near the Moravian town of Litovel. In spite of the fact that the arboretum has an area of only 2.4 hectars it is the most beautiful park found in Moravia at an altitude of 280 - 290 meters above sea level. The nucleus of the arboretum was planted in 1869. Its dendrological value was greatly increased in 1926 when Q. Riedl planted many species. Exotic decorative woody species are cultivated - a total of 500 are found here. Since 1945 the arboretum has the status of a Nature Reserve. All those interested in nature conservation and botany will profit from an excursion to Bílá Lhota.

didactics of biology - biology instruction - excursion - arboretum - hobby club activities - decorative plants - Czechoslovakia. 147311.

311. **ARIFKHOZHAEV, S.A.:**
Na shkolnikh uchebno-opitnikh uchastkakh Uzbekistana
(School experimental plots of land in Uzbekistan)
Biologiya v shkole, 58, 1984, No. 1, p. 72.

All 5 743 general education schools in the Uzbek Soviet Socialist Republic have experimental plots of land or green laboratories, as they are sometimes called, where pupils cultivate vegetables, cereals and carry out experiments with the cross - breeding of plants. The author describes the results achieved by some of these experimental plots of land and assesses in a positive manner the attitude of pupils towards nature, their native region, agriculture and their endeavours to supply the school biology stock room with various specimens and exhibits.

didactics of biology - biology instruction - school plot of land - Uzbek SSR - USSR. 147311.

312. **BLAGOSKLONOV, K.N.:**
Prirodno-uchebniye tropi (Nature science trails)
Biologiya v shkole, 58, 1984, No. 4, pp. 66-68.

The author describes various types of science trails, which can stress nature in general, science or ecology. He explains their importance for nature conservation, especially in urban areas or in school forestry areas, how excursions to these trails should be organized, which information signs and indicators should be placed directly on the trail, etc. He cites examples of various science trails which specialize in different things - for instance ornithology, botany, phenology, etc.

didactics of biology - biology instruction - botany - science trail - ecology - USSR. 147311.

313. BUBEN, A.P.:

Letom na shkolnom uchastke. (Summer at a school plot of land)

Biologiya v shkole, 58, 1984, No. 3, pp. 54-55.
1 tab.

The author is a teacher at the Patseichski secondary school in the Byelorussian SSR. Here he answers various questions sent to him by teachers concerning work on the school plot of land during the summer vacation. This problem is first discussed as the school Pedagogical Council, which prepares a schedule of when various members of the staff will have responsibility for the plot of land during the summer vacation. Vacations are planned in such a way that some of the staff are always available. Also older pupils participate in caring for the plot of land.

didactics of biology - biology instruction - school plot of land - vacations - USSR. 147311.

314. BUSCHENDORF, J.:

Unterricht über "Liliengewächse" in einem botanischen Garten (Instruction on the liliaceae in a botanical garden)

The teaching syllabus for 5th class biology recommends instruction on the liliaceae when local conditions make it possible to find samples. Teachers usually do not have sufficient experience with this topic, since very little has been published on the subject. The author points out that it is possible to make use of the Botanical Gardens in Halle where 80 different species of liliaceae are cultivated. The following aspects should be stressed in instruction: morphological signs, type of fruit, pollination by insects, bulbs and their function, variability within the genus. Instruction should concentrate on observations and work with natural specimens, the distinction of essential and non-essential characteristics, explaining the relationship between structure and function, etc. Species which are especially suitable for use in class work are cited and their main characteristics summed up in a table.

didactics of biology - biology instruction - botany - 5th class - liliaceae - botanical garden - GDR.
147311.

315. DERGACHEV, S.I.:
Trud i opitnichestvo na uchastke i shkolnoy paseke
(Work and experiments on a school plot of land and school bee hive)
Biologiya v shkole, 58, 1984, No. 4, pp. 59-62.

The author describes his experience in combining instruction with productive work on a school plot of land and in a school bee hive. The plot of land in the school where the author teaches has 16 hectares. 8 are devoted to fields where various crops are cultivated and the remainder are orchards. The author describes the work done by the pupils and its relationship to school biology instruction.

didactics of biology - biology instruction - school plot of land - school bee hive - socially beneficial work - USSR. 147311.

316. DUBETENE, V.:
Uchebniy uchastok - shkola trudovikh navikov
(An experimental plot of land as a place to learn work habits)
Biologiya v shkole, 58, 1984, No. 3, p. 56.

The author acquaints readers with the organization of work on the school plot of land at the Gyalvonsk school in the Lithuanian SSR. All activities, procurement of materials and work during vacations are planned ahead of time, so that a good crop is assured.

didactics of biology - biology instruction - work on school plot of land - Lithuanian SSR - vacation - USSR. 147311.

317. ERSHOV, V.L.:
Uchebno-opitniy uchastok pri selskom uchebno proizvoditelnom kombinate (A teaching and experimental plot of land at an agricultural teaching and production enterprise)
Biologiya v shkole, 58, 1984, No. 5, pp. 58-61.

The author describes the experiences and organization of work of pupils on an experimental plot of land in a school teaching and production enterprise in the Rechitski region of the Byelorussian SSR. Pupils from the 9th and 10th classes have the subject crop production, the foundations of animal husbandry and agricultural mechanization in the curriculum. Within its framework they carry out small scale experiments according to the requirements of the local agriculture in the region.

didactics of biology - biology instruction - foundations of agricultural production - school plot of land - USSR. 147311.

318. KHARCHENKOVA, E.A.:
Razvitie tvorcheskoy aktivnosti shkolnikov v processes sozdaniya ekologichskoy tropi (Developing the creative activities of pupils in building an ecological science trail)
Biologiya v shkole, 59, 1984, No. 4, pp. 69-72

The author describes the building of a science trail in the Izmailov Forestry Park near Moscow. She describes the activities of individuals and groups in various stages of building the trail and discusses the choice of locality, the facilities and information made available etc.

didactics of biology - biology instruction - science trail - USSR. 147311.

319. KULICH, J.:
Využití botanických zahrad při výuce botaniky
(Making use of botanical gardens in botany teaching)
Přírodní vědy ve škole, 35, 1983-1984, No. 8, pp.285-287.
Lit. 8, 1 photo.

The Flora Botanical Gardens in Olomouc annually organize a week for school pupils, usually at the beginning of June. Last year 1 400 pupils made use of the opportunity and saw the 47 hectars of greenhouses, as well as the many flower beds found there. The author describes the various plants found there and the opportunities this provides for school botany instruction.

didactics of biology - biology instruction - botanical garden - excursions - Czechoslovakia. 147311.

320. OSTROVSKAYA, I.B.:
Vasha teplica (Your greenhouse)
Biologiya v shkole, 58, 1984, No. 3, pp. 51-52.

The author describes the organization of a school greenhouse. She discusses disease prevention and measures taken against pests in greenhouses, the dates when various chemicals should be used, when and how the soil should be prepared, the cultivation of seedlings, and how the growth of various plants can be regulated.

didactics of biology - biology instruction - school greenhouses - plant cultivation - USSR. 147311.

321. SAFRONOVA, A.F.:
Spasibo kollektivu i direktsii shkoli (Our thanks to the staff and to the principal of the school)
Biologiya v shkole, 58, 1984, No. 3, pp. 55-56.

The author informs readers about how the whole staff of the school, including the principal and all teachers, took care of the school garden and plot of land during the school summer vacation. The school in question is in the Penzenski region. A plan was drawn up where the responsibility of each person was defined.

didactics of biology - biology instruction - school plot of land - organisation of work - summer vacation - USSR. 147311.

10.2.7.3 Museums

322. RODZIK, H.:
Jak rozwijam zainteresowania biologiczne uczniow
(How I develop pupil´s biological interests)
Biologia w shkole, 37, 1983, No. 1, pp. 53-55.

The author organises pupils´collection of specimens and their mounting for class work. These specimens include not only mounted plants and animals, but also a collection of mosses and minerals. The school collection of marine animals is very interesting, as well as bird feathers, nests and eggs, a collection of exotic and domestic molluscs, etc. This material is also used in the school laboratory and in class work.

didactics of biology - biology instruction - original objects - school biology store room - museum - specimens for class work - Poland. 147311.

10.4.2 Dissection of animals

323. BERMAN, W.:
Dissection Dissected
The Science Teacher, 51, 1984, No. 6, pp. 42-49.
3 photos.

The author discusses dissecting in school from various points of view. He stresses the need to honor all forms of life and understanding the indivisibility of living organisms. On the other hand the importance of dissections in school laboratories is stressed if students are to become acquainted with animal anatomy and physiology, the use of analogical and homological organs of the dissected animals, learn about the relationship between an organism and the environment and the evolution of animals. Dissections are in fact detailed analyses. Thus the author does not reject dissections done in school, but merely points out that in many cases they can effectively be substituted for by good slides.

didactics of biology - biology instruction - original object - dissections - zoology. USA. 147311.

324. LEE, A.:
The Forminalized Rat: A Conveniet Microbial Ecosystem
The American Biology Teacher, 46, 1984, No. 1, pp.48-52.
5 photos, 1 tab.

When a rat is being dissected it is a good idea to forminalize the intestines and the stomach and then to use them for bacteriological analysis.

237

The stomach usually contains gram positive samples of the bacterium Lactobacillus, while the intestine usually has few bacteria because of its alkaline content. The appendix contains as many as 200 species of bacteria which decompose cellulose (99.99 %) and are aerobic bacteria . The author describes the outcome of the analysis in detail.

didactics of biology - biology instruction - dissection - mammal - rodent - ecosystem - bacteria - digestive system - microbiological analysis - USA. 147311.

10.6.1 Models

325. BARETT, D.R.B.:
Pleural membranes as a simple model
Journal of Biological Education, 18, 1984, No. 1, p.15.
1 fig.

Models are frequently used to demonstrate the structure and function of the respiratory system. These include models of the diaphragm and intercostal muscles and their function. The model described in this article adds another to this series, a model of pleural membranes, which explains their function.

didactics of biology - biology instruction - human biology - respiration - model - Britain. 147311.

326. BASSE-LÜSEBRINK, B. - LORENZ, R.:
Bau und Betrieb eines elektronischen Nervenfunktionsmodelles (The building and operation of an electronic functional model of nerves)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 5, pp. 135-140. Lit. 6, 10 figs.

The author describes a model which demonstrates the functioning of the nerves. The model is electronic and uses optical and acoustic signals to show the functioning of a nerve cell. The model itself and instructions for building it are described in detail.

didactics of biology - biology instruction - human biology - human nerve cell - demonstration - FRG. 147311.

327. DAVISON, J.:
Teaching basic anatomy in lower school
The School Science Review, 66, 1984, No. 234, pp.83-84.

The author describes the making of a flat model of the lungs, heart, brain, stomach, pancreas, the small and large intestines, appendix, uterus, kidneys, liver and urinal bladder. The model can be made by pupils in the 3rd class of secondary school.

didactics of biology - biology instruction - human biology - anatomy - pupil assignments - model - Britain. 147311.

328. FREEDMAN, R.B.:

The fluid mosaic model of the structure of biological membranes - its strengths and limitations

The School Science Review, 65, 1984, No. 233. pp.679-691.

The first model of a biological membrane was made by Davson and Danielli in 1935. In 1960 the model was changed. By 1970 it was generally acknowledged that this model was no longer adequate and in 1972-1975 a new fluid mosaic model was made by J.S. Singer and G. Nicolson. The author now describes a newer model of the structure and function of a membrane, which shows how separation and selection take place, the functioning of the transportation system, the potassium pump, and the system of receptors for distinguishing and reacting to hormones and neurotransmitters, as well as the working of a system for energy conservation. The author at the same time sums up the history of models which study the membrane.

didactics of biology - biology instruction - cell - membrane - model - Britain. 147311.

329. JENTZEN, W.:

Ein Modell - Versuch zur Reizleitung am Axon (Das Oswald-Lillasche Eisendrahtmodell) (A model experiment on axone stimulation - the Oswald-Lillasche wire model)

Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 5, pp. 140-142. Lit. 3. 1 worksheet, 1 tab.

The author describes a very interesting model, which has many homologies with processes taking place in axones and neuron extentions. A nail made of pure iron is submerged into concentrated nitric acid in which it acquires an oxide coating. When this layer is scraped off mechanically at any point (and the nerve is stimulated), then wave potentials occur which can be identified by the escaping gas bubbles. In the discussion which follows the demonstration these waves are compared with what goes on in an axone.

didactics of biology - biology instruction - human biology - neurophysiology - nerve cells - model - FRG. 147311.

330. LEHMAN, H.:
Gute Erfahrungen mit dem Übungskasten "Mendelsche Gesetze" (Positive experiences with an excercise kit called "Mendel´s laws")
Biologie in der Schule, 33, 1984, No. 11, pp.424-425.
1 tab.

The biology teaching syllabus assumes that in the 10th class pupils are taught about the law of the uniformity of the F_1 generation in heredity which assumes the use of a model, which, however, in the majority of cases is not available. For this purpose the author made an excercise kit, which he describes and also how it is used. The advantage of the kit is that each pupil can have his own for work in class.

didactics of biology - biology instruction - genetics - model - 10th class - GDR. 147311.

331. **MARKOV, V.V.:**
Kak sdelat model "pobeg" (How to make the model of a stem)
Biologiya v shkole, 58, 1984, No. 6, p. 51.

The author describes the making of a simple model of the plant stem for use in botany instruction in the 5th class. He uses wood, plastics and paint. Older pupils can make the models in the school workshop. The model is described in detail, including its size.

didactics of biology - biology instruction - botany - plant morphology - stem - model - USSR. 147311.

332. **ŠIMEČEK, R.:**
Modely ovoce (Models of fruit)
ABC mladých techníků a přírodovědců, 28, 1983-1984, No. 4, p. 12, 1 photo.

The author describes the making of models of fruit. They can be made from plaster of paris and then sandpapered. A spoon of oil is required and paints.

didactics of biology - biology instruction - botany - fruit - model - Czechoslovakia. 147311.

10.7.2 Television and radio in school

333. DOBROWOLSKA, I.:
Film przyrodniczy inspiracja nowych pomysłow (Nature films as an inspiration for new ideas)
Biologia w szkole, 36, 1984, No. 2, p. 117.

The author describes how she uses school nature films, how she shows these films to pupils and how she makes use of the subject-matter of the films in class work. She cites specific examples from various fields of biology. The films discussed were produced for TV.

didactics of biology - biology instruction - television - nature films - class work - Poland. 147311.

334. GREBEN, G.A.:
Plan uchebnikh televizionnikh peredach po biologii na 1984-1985 uchebniy god (A plan of educational television films planned for the 1984-1985 school year)
Biologiya v shkole, 58, No. 4, p. 42.

The author describes films planned for broadcasting in the next school year which concern biology. This plan makes it possible for teachers to plan ahead of time which films can be made use of in biology teaching.

didactics of biology - biology instruction - TV nature films - plan for next school year - USSR. 147311.

335. KLEIN, A. - LIES, E.:
Schulfunk in fakultativen Kursen nach Rahmenprogramm
(The school radio in elective hobby club activities)
Biologie in der Schule, 33, 1984, No. 5, pp. 174-177.

The authors describe experience gained in the utilization of school radio programs at an experimental school in Potsdam. They specifically cite the example of a program called "Justus Liebig" which provides opportunities for acquainting pupils with the history of various discoveries, how to formulate various problems, etc.

didactics of biology - biology instruction - school radio - elective courses - hobby clubs - GDR. 147311.

336. Kratkie annotacii televizionnikh uchebnikh peredach po botanike na perviy cetvert 1984-1985 uchebnogo goda
(Brief annotations of educational television programs on botany in the first quarter of the 1984-1985 school year)
Biologiya v shkole, 58, 1984, No. 4, pp. 43-44.

The author cites all television programs concerned with botany for the first three months of the new school year, giving their brief descriptions. This will enable teachers to plan their use in class work.

didactics of biology - biology instruction - botany - television - USSR. 147311.

337. **MASHAROV, I.M. - TARUSNA, T.M.:**
"Kratkie annotacii televizionnikh uchebnikh peredach po botanike i zoologii na II. polugodie 1984-1985 uchebnogo goda (Brief annotations of educational television programs on botany and zoology in the first term of the 1984-1985 school year)
Biologiya v shkole, 58, 1984, No. 6, pp. 49-50.

The authors provide brief descriptions of various television programs on botany and zoology which will be broadcast in the second term of the 1984-1985 school year. They provide basic information on the date, duration and content of each program and the opportunities it provides for class work.

didactics of biology - biology instruction - botany - zoology - television program - USSR. 147311.

338. **MATVEEVA, L.V.:**
Kratkie annotatsii televizionnikh uchebnikh peredach po obshchey biologii na III chetvert 1984-1985 uchebnogo goda (Brief annotations on television programs concerning general biology in the third quarter of the 1984-1985 school year)
Biologiya v shkole, 58, 1984, No. 6, pp. 50-51.

The author provides brief information on all television programs broadcast in the third quarter year of the 1984-1985 school year which have a bearing on general biology and can be made use of in school instruction.

didactics of biology - biology instruction - general biology - television programs - USSR. 147311.

339. MARVEEVA, L.V. - TARUSOVA, T.M.:
Kratkie annotatsii televizionnikh uchebnikh peredach po zoologii i obshchey biologii na II četvert 1984-1985 uchebnogo goda (Brief annotations on television programs concerning zoology and general biology in the second quarter year of the 1984-1985 school year)
Biologiya v shkole, 58, 1984, No. 5, pp. 53-54.

The authors provide brief information on all television programs concerning zoology and general biology which will be broadcast in the second quarter year of the 1984-1985 school year. They cite the uses of the programs from the point of view school instruction.

didactics of biology - biology instruction - zoology - general biology television program - USSR. 147311.

340. SCHUBERT, F.:
Schulfernsehen im Schuljahr 1984-1985 (School television in the 1984-1985 school year)
Biologie in der Schule, 33, 1984, No. 7-8, pp.306-308.
3 tabs.

Broadcasts for the 5th, 9th and 10th classes have the same form and the same schedule as last year. For these classes the author cites the names and content of all programs, as well as their duration. A summary table gives dates.

didactics of biology - biology instruction - television program - GDR. 147311.

10.7.3 Pictures and three-dimensional pictures

341. GROMOVA, E.P. - LENINA, V.G.:
K ispolzovaniyu tablits po gigiene pri izuchenii v VIII. klasse (The use of tables in teaching hygiene in the 8th class)
Biologiya v shkole, 58, 1984, No. 2, pp. 44-51. 5 tabs.

The reform of general education and vocational schools also assumes an improvement in the teaching of hygiene. A set of tables has been published for teaching human biology and hygiene. They illustrate various aspects of this subject-matter and the authors explain how they should be used. Among the things shown is the influence of physical excercises on the human organism, the prevention of problems with the spinal column and flat feet, the importance of exercises for the heart, respiration hygiene, etc. The set is composed of 16 tables.

didactics of biology - biology instruction - human biology - hygiene - 8th class - pictorial tables - USSR. 147311.

342. GROMOVA, E.P. - LENINA, V.G.:
K ispolzovaniyu tablits po gigiene pri izucheniyu biologii v VIII klasse (On making use of tables comcerning hygiene in biology instruction in the 8th class)
Biologija v shkole, 58, 1984, No. 5, pp. 45-52.

The continuation of an article on this same subject from a previous issue. This time the authors discuss the use of tables in the hygiene course in the 8th class which concerns the prevention of droplet infection, the hygiene of food and eating, the prevention of intestinal infections, daily vitamin requirements and the importance of making the organism hardy. The authors suggest various methodological procedures when these tables are used in class.

didactics of biology - biology instruction - hygiene - picterial tables - USSR. 147311.

343. REID, D.J.:
The picture superiority effect and biology education
Journal of Biological Education, 18, 1984, No. 1,
pp. 29-36. Lit. 75.
2 figs.

The author discusses the advantages of using pictures in biology instruction. Pictures increase the influence of teaching and its impact. The author analyses this effect on the basis of extensive literature on the subject and on the basis of special empirical studies.

didactics of biology - biology instruction - pictures - study of effect - Britain. 147311.

344. SEREBRYAKOVA, T.I.:
K ispozovaniyu tablits "Vegetativniye organi rasteniy"
(On the use of a pictorial table "The vegetative organs of a plant")
Biologiya v shkole, 58, 1984, No. 6, pp. 33-42.
Lit. 1, 3 tabs.

A series of pictures called "Vegatitive plant organs" has been published for botany teaching in the 5th class of basic school. The author offers comments and criticism on some terminological problems in the accompanying text. 5 pictures deal with the structure of buds, the development of the stem, its great variety and with the detailed structure of a linden tree.

didactics of biology - biology instruction - pictures - plant morphology - buds - stems - USSR. 147311.

345. ZHARKOVA, V.K. - KOVALEVA, I.N. - PUGAL, N.A.:
O relyefnikh tablitsakh (On three dimensional tables)
Biologiya v shkole, 58, 1984, No. 5, pp. 52-53.

The authors provide information about a set of anatomical pictures for botany, zoology and human biology teaching. The pictures acquaint pupils with the position and pattern of cells, tissues and organs and with systems of organs both in the plant and animal kingdoms.

didactics of biology - biology instruction - pictures - anatomy - botany - zoology - human biology - USSR. 146311.

10.7.3.3 Foils and transparencies

346. GERHARDT, A.:
Pflanzen als Bioindikatoren für die Luftverschmutzung. Erläuterungen zum Folie (Plants as bio-indicators of air pollution. Explanations to accompany foils)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 3, p. 104, 2 figs.

The author explains how to use foils which show lichen as bio-indicators of air pollution. Species which are especially sensitive to air pollution are cited. They can be used for independent pupil assignments and in field work.

didactics of biology - biology instruction - environmental conservation - air pollution - bio-indicators - lichens - FRG. 147311.

347. SCHEEL, H.:
Vorschläge zur Veranschaulichung der Mendelschen Gesetze (Suggestions for drawing diagrams of Mendel's laws)
Biologie in der Schule, 33, 1984, No. 11, pp. 415-417.

When learning about Mendel's laws, pupils should understand that heredity is a necessary phenomenon and that by the recombination of different characteristics, individuals with new characteristics develop. Showing this fact requires the drawing of various diagrams, either on the blackboard or on a transparency which is shown with an overhead projector. Experiments are not used frequently, because they require a great deal of time which is not available in class. But teacher training students are aquainted with these experiments during their study and also in the further education of teachers this problem is studied. If teachers had the original objects necessary for such experiments readily available - the author recommends the fruit fly or the tomato - they could attempt these experiments in school.

didactics of biology - biology instruction - genetics - transparencies - GDR. 14/311.

10.7.4 Photographs, macrophotographs, microphotographs, photoherbariums

348. BALTUS, J.:
Lednické foto-safari (A photosafari at Lednice)
Věda a technika mládeži, 38, 1984, No. 16, pp. 500-501.
2 photos.

The author describes a safari where animals were "hunted" with a camera and which took place at Lednice where a science trail around various fish ponds has been developed. 18 boys and girls participated. During the excursion they carried out ornithological observation, worked on the conservation of some historical monuments and wandered around the landscape with cameras. After returning home they published their own edition of the popular youth magazine Mladý svět and organized an exhibition of their photographs. The field work they did was concerned with nature conservation.

didactics of biology - biology instruction - science trail - photography - Czechoslovakia. 147311.

349. Botanický herbář. Barclaya longifolia (A botanical herbarium. Braclaya longifolia)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 3, pp. 18-19. 2 photos.

The editors describe the water plant Barclaya longifolia, which is also very suitable for cultivating in an aquarium. It requires a steady temperature of 20 $^{\circ}$C. This plant family has 5 different species. The plant originated in Burma and Thailand. This article is suitable for aquarium hobby clubs.

didactics of biology - biology instruction - botany - aquarium plants - hobby club - photo-herbarium - Czechoslovakia. 147311.

350. Botanický fotoherbář. Hlohy. (A botanical herbarium. The hawthorns)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 17, pp. 18-19. 5 photos.

There are 900 species of hawthorns, most of them found in North America. Various local species are described, as well as those which originate elsewhere but are cultivated as decorative plants. The fruit of the hawthorn is important as a medicinal plant . This information can be used in botany teaching or in hobby club activities.

didactics of biology - biology instruction - hobby club - photos of plants - decorative plants- Czechoslovakia. 147311.

10.7.5 Slides and slide series, projected microscopic specimens

351. BARMAN, C.R.:
How to prepare Clay-Lift and Sandwich Slides
The American Biology Teacher, 56, 1983, No. 2,
pp. 120-121.
Lit. 2, 7 photos.

The author describes a method of making slides without photographic film, with the help of special clay-based paper. One method is based on the use of clean adhesive contact paper, on which the specimen is fixed and the other, sandwich method, uses two transparent films. Both techniques are inexpensive and the making of good quality slides takes only several minutes.

didactics of biology - biology instruction - teaching medium - slides - USA. 147311.

352. STORRER, J. - ARENE, D.:
Einsatz von Dias und Overhead Projektoren im experimentellen Biologieunterricht II (The use of slides and an overhead projector in experimental biology teaching II)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 8, pp. 248-253. Lit. 3, 6 figs., 1 tab.

The authors describe an experiment on the topics "Cybernetics" and "Learning and memory." The experiment requires the use of slides, an overhead projector and a slide projector. The pupils at the same time carry out the experiment and assess its outcome. The experiment itself concerns the optical assessment of a movable target and remembering various circumstances. The authors distinguish ultrashort memory (20 to 30 seconds), short memory (20 minutes) and long-term memory (more than 20 minutes).

didactics of biology - biology instruction - experiment - teaching media - slides - human biology - memory - Czechoslovakia. 147311.

10.7.6 Sketches, floral diagrams and formula, models for copying

353. BETZ, P.:
Die Photosynthesis als Black-box System. Ein Beitrag zur didaktischen Reduktion (Photosynthesis as a black-box system. An example of didactical reduction) Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 1, pp. 20-26. Lit. 24, 10 figs.

The author demonstrates the problem of a didactical reduction in teaching about biochemical processes. The majority of botany textbooks offer only a traditional summary equation on the basis of which the pupil is expected to understand photosynthesis. Yet this equation in itself is insufficient to produce an understanding of the process. On the other hand the problem of photosynthesis cannot be explained to pupils fully within the framework of school instruction. The author uses the black box concept and on the basis of drawings and diagrams he explains individual stages of photosynthesis. Experience has indicated that pupils are capable of understanding these pictures and diagrams very well and thus acquire a deeper understanding of this basic biological process.

didactics of biology - biology instruction - teaching media - drawings and diagrams - plant physiology - photosynthesis - FRG. 147311.

354. GEHENDGES, F.:
Eine sinnvolle Ergänzung gross- und kleinformative Kopiervorlagen (A suitable supplement: small-scale and large-scale models for copying)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 4, pp. 137-140.

The author demonstrates the use of small-scale and large-scale models for copying for the topic The Laws of Heredity. The models can be used independently or together with worksheets, workbooks or with tests.

didactics of biology - biology instruction - teaching medium - drawing - worksheet - copying - FRG. 147311.

10.8.3 Textbooks, methodological handbooks

355. BROVKINA, T.Y. - MYAGKOVA, A.N. - REZNIKOVA, E.V.:
Formirovanie u shkolnikov umeniy rabotat s uchenikom - odin iz putey normalizatsii uchebnoy nagrizki
(Developing pupils´ skills in working with a textbook as one of the ways of normalizing the overloading of pupils)
Biologiya v shkole, 58, 1984, No. 5, pp. 19-25.
4 tabs.

Among the important things pupils should learn in school is how to use a textbook for learning. The authors cite three types of these skills: the skill of using the orientation apparatus of the textbook, the skill to work with the text and the skill to work with the illustrations. In the form of a table the authors cite a survey of required skills in each of the three above mentioned categories.

didactics of biology - biology instruction - textbook - teaching medium - work with literature - USSR. 147311.

356. CICHY, D. - WTORKIEWICZ, D.:
Efektywność programów nauczania biologii w świetle badań (The effectiveness of biology teaching syllabi in the light of studies on this subject)
Biologia w szkole, 37, 1984, No. 5, pp. 293-303.
Lit. 6. 6 tabs.

The authors inform readers about the outcome of a study to determine how effective the biology teaching syllabus for various classes is (from the 4th to the 8th). The results are summed up in a table.

didactics of biology - biology instruction - teaching syllabus - study - Poland. 147311.

357. IGNATOWSKA, J. - MATYSIAK, R. - EJSMONT, J. - STEPCZAK, K.:
Z dyskusji nad podrecnikem dla klasy IV. (From the discussion concerning the textbook for the 4th class)
Biologia w szkole, 27, 1984, No. 1, pp. 59-62.

The first three authors of this article are elementary teachers and here they express their opinion on a biology textbook for the 4th class, published by WSP, Warsaw in 1982. They analyse the structure of the textbook, stress its ecological approach and point out some errors and lack of precision, which should be corrected in future editions. K. Stepczak is the author of this textbook; here he reacts to some of the criticism and describes some of the changes he intends to make in the textbook.

didactics of biology - biology instruction - teaching media - textbook - 4th class - basic school - review - Poland. 147311.

358. LAMBREVA, D.:
Obshchestvyavane na politekhnicheskaya printsip na obuchenie v uroka "Kulturni ekosystemi" v sedmi klas
(The implementation of the polytechnical principle in classwork in the topic " Cultural ecosystems" in the 7th class)
Biologiya i khimiya, 27, 1984, No. 4, pp. 27-30.
1 tab.

The author demonstrates the use of the polytechnical principle on the basis of the example of how the biology textbook for the 7th class of basic school deals with the subject of a cultural (i.e. artificial) ecosystem. She suggests supplementing class work with a discussion with an agricultural engineer and showing a slide series called "A Rye Field".

didactics of biology - biology instruction - teaching media - textbook - slide series - polytechnical education - botany - Bulgaria. 147311.

359. NAVRÁTILOVÁ, K.:
Učenie o prírode a společnosti z hlediska mentalného vývoja žiakov (Learning about nature and society from the point of view of the mental development of pupils)
Komenský, 108, 1933-1984, No. 1, pp. 24-27. Lit. 9.

The restructuring of the teaching syllabus used for the subject Learning about Nature and Society, in basic school, takes into consideration the mental stages of development of younger school children and will create the prerequisites for the systematic and adequate development of the intellect abilities and qualities of pupils. The author analyses methods of work with the textbook, discusses the environment in which young school children live and the personality development of the pupil.

didactics of nature studies - teaching media - textbook - mental development - basic school - Czechoslovakia. 147311.

360. SLADKOV, A.H.:
O novom izdanii uchebnika "Botanika" dlya V - VII klassov sredney shkoli (On the new edition of the botany textbook for the 5th and 6th classes of secondary school)
Biologiya v shkole, 58, 1984, No. 3, pp. 41-44.

Since the 1984-1985 school year a new version of the botany textbook has been in use in secondary schools; the 17th revised edition of a textbook which was written by V.A. Korchagina and published posthumously. The author of the present article carried out various changes for this most recent edition, which he describes. He corrected some errors, changed a summary, placed greater stress on ecological aspects, nature conservation, links with practical agritulture and the relationship of botany to the Agricultural Program of the USSR. He also included better illustrations.

didactics of biology - biology instruction - botany - teaching media - textbook - secondary school - USSR.
147311.

361. WRIGHT, J.D.:
How Important is Textbook Readability to the Biology Teacher ?
The American Biology Teacher, 46, 1984, No. 4, pp. 221-226. Lit. 14, tab. 3.

Very often students have problems with understanding textbooks. They are unable to gain information from a difficult text and most of their energies and attention are concentrated on decoding words, rather than understanding ideas. The author discusses ways and means open to the biology teacher to ease this problem. An experiment was carried out among both teachers and students concerning the readability of various texts. It was found that the most important single factor for influencing the readability of a text is the extent of the vocabulary it uses. Simpler, shorter words, which are less technical, are more readily understood. Another factor is the structure of paragraphs, how specific the text is and how interesting the subject-matter with which it deals. In conclusion the author provides instructions for biology teachers for using textbooks in class work and making it easier for students to understand what they are reading.

didactics of biology - biology instruction - teaching medium - textbook - study of readability - USA.
147311.

10.8.5 Worksheets, workbooks, didactical tests, questionnairs, didactical cross-word puzzles, didactical games, etc.

362. BITTITOE, T.W. - BRADLEY, J.V.:
A teacher's Dream Come True - A Simple Program for Writing Tests
The American Biology Teacher, 46, 1984, No. 3,
pp. 178-182. 1 tab.

The author provides information on a new program for writing biology tests, which is done on an Apple computer with a 48 K memory and printer, which can make large numbers of copies. Special floppy discs are provided with 275 questions from various biological fields so that the teacher can make up his own test and is also provided immediately with an answering modul. The author describes in detail how to draw up a test for students, make copies of it and correct`it with the aid of a computer.

didactics of biology - biology instruction - teaching medium - tests - computers - USA. 147311.

363. BARKER, J.A.:
<u>Simulating Evolution</u>
Journal of Biological Education, <u>18</u>, 1984, No. 1, pp. 13-15. 2 figs.

The author describes a game for learning about evolution which has been tested at a university. The game is based on the premise that similar organisms are related biologically, while those that differ greatly are not related. Students cut out the pictures of various plants and animals and glue them on a strip of thin paper, in evolutionary series.

didactics of biology - biology instruction - evolution - didactical game - Great Britain. 147311.

364. BROGMUS, H. - DIRCKSEN, R.:
Arbeitsblätter zum Thema "Die Natur im Wechsel der Jahreszeiten" - 8 (Worksheets for the topic "Nature in the changing seasons of the year" - 8)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 4, pp. 113-120. Lit. 17, 3 worksheets, 5 figs.

The eighth installment of a series of articles concerning the topic Nature in the changing seasons of the year. This section is devoted to migratory birds. The author concentrated on 12 species of birds; he describes the reasons for their migrations, preparations for migration, locations where they spend the winter and how they achieve orientation. Besides basic information on birds, the author also provides various methodological instructions on how to deal with this topic and how to give pupils independent assignments on this subject-matter.

didactics of biology - biology instruction - teaching medium - worksheets - ornithology - PRG. 147311.

365. BURNET, W.L.:
Demonstrating Cell Division with Playing Cards
The School Science Review, 65, 1984, No. 232, pp. 501-502. 3 figs.

The author uses two sets of playing cards to demonstrate cell division. Two identical cards are attached to a piece of paper with paper clips. Both cards represent chromatids and together a chromosome. The paper clip represents a centromere. Pupils receive "nuclei". Each contains a number of red chromosomes, from 10 to ace and a similar set of black ones. On the basis of these cards, meiosis can be simulated.

didactics of biology - biology instruction - cell division- meiosis - didactical games - simulation - Great Britain. 147311.

366. DIRCKSEN, R. - BROGMUS, H.:
Arbeitsblätter zum Thema: "Die Natur im Wechsel der Jahreszeiten" - 6 (Worksheets on the topic "Nature in the changing seasons of the year" - 6)
Naturwissenschaften im Unterricht, 32, 1984, No. 1, pp. 6-9. Lit. 11, 1 worksheet.

In the 6th installment of a series of articles on this subject the authors deal with problems of how plants survive the winter. It can be used in teaching in the 6th class. The problem concentrates on the adaptation of annual and perennial plants to winter weather. The plants cited as examples are chosen to demonstrate the effect of cold weather on various plant organs. In the 7th and 8th classes the worksheet provided can be used to demonstrate mechanisms by which plants react to low temperatures. The authors describe the thematic unit as a whole, recommend suitable teaching media and discusse which aspects of the topic may be difficult for pupils to comprehend.

didactics of biology - biology instruction - botany - plant physiology - plant morphology - FRG. 147311.

367. GERHARDT, A. - BROGMUS, H.:
Arbeitsblätter zum Thema "Die Natur im Wechsel der Jahreszeiten" - 9 (Worksheets on the topic "Nature in the changing seasons of the year" - 9)
Naturwissenschaften im Unterricht, 32, 1984, No. 6, pp. 177-183. Lit. 12, 2 figs., 3 worksheets, 3 tabs.

On the basis of worksheets the authors deal with the problems of relations between flowers and insects which pollinate the plants. Flower signals with which the plant lures the insects are explained, as well as various types of flowers and how insects are adapted to them by special anatomical structures. Also the mechanisms which lead to pollination are described.

didactics of biology - biology instruction - plant morphology - flowers - insects - pollination - teaching medium - worksheet - FRG. 147311.

368. GERHARDT, A. - BROGMUS, H.:
Arbeitsblätter zum Thema: "Die Natur im Wechsel der Jahreszeiten" - 10 (Worksheets on the topic "Nature in the changing seasons of the year" - 10)
Naturwissenschaften im Unterricht, 38, 1984, No. 10, pp. 321-327. Lit. 27, 4 figs., 3 tabs.

The last installment in a series of articles which deal with how the changing seasons are reflected in nature. This article deals with the ecology of higher fungi, their development, characteristics and the ecological problems they have, as well as the specific aspects of the substrate upon which they grow, fungi communities and the succession of individual fungi species. The authors provide a number of interesting examples.

didactics of biology - biology instruction - teaching medium - worksheet - mycology - ecology - FRG. 147311.

369. JOURNET, A.R.P.:
Peeking the Most into Genetics
Science Teacher, 51, 1984, No. 7, pp. 50-53. 2 figs.

The author describes a video game which provides an understanding of genetics and heredity processes. This represents a new method of dealing with general biology problems in class work.

didactics of biology - biology instruction - teaching medium - didactical game - USA. 147311.

370. NÜCHTERLEIN, BLOSCZYK, S.:
Rollespiel vom sauren Regen und dem Waldsterben
(A game with role playing on acid rain and the dying of the forests)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 11, pp. 390-399. Lit. 38, 2 information sheets.

The authors describe a game in which pupils take on various roles; its purpose is to provoke pupils to seriously consider the costs of saving the forests and how they can contribute to this effort.

The roles include Prof. Acid and four members of the German parliament who argue the case for taking measures towards saving the forests. Preparations for the game require dividing pupils into smaller groups which contributes to making biology instruction more interesting.

didactics of biology - biology instruction - didactical game - environmental conservation - acid rain - FRG. 147311.

371. TASHIRO, M.E.:
A Natural Selection Game
The American Biology Teacher, 46, 1984, No. 1, pp. 52-53.

The author describes a game where natural selection is simulated. It concerns the evolution of hominids and takes into consideration such factors as manual skills, attitude, colour of skin, size of brain, social behaviour, amount of hair on body, colour and shape of hair, resistence to chemical substances and resistence to radiation.

didactics of biology - biology instruction - evolution - didactical games - simulation - USA. 147311.

10.8.6 Atlases, keys and punch cards to identify natural objects

372. ANDĚRA, M.:
Klíč k určování našich savců: Letouni (A key to identifying our mammals: Chiroptera)
ABC mladých techniků a přírodovědců, 28, 1983-1984. No. 22, p. 18.

The author provides a key for use in practical excercises or by young zoologist hobby clubs which they can use to identify the Chiroptera order and various species of Rhinolophidae or Horseshoe bats. These bats have wide, rounded wings and a typical slow manner of flying.

didactics of biology - biology instruction - teaching medium - zoology key - Chiroptera - Czechoslovakia.
147311.

373. MLADÁ, J.:
Určování rostlin na základní škole (Identifying plants in basic school)
Přírodní vědy ve škole, 35, 1983-1984. No. 7, pp.246-250.
Lit. 3, 33 figs.

The author discusses the possibility of teaching basic school pupils how to identify plants within the framework of botany instruction. There are 3 000 species of higher plants which grow in this country; some of them can be chosen for use in class work. The author describes methods of teaching pupils how to identify plants and how to use a special simplified key for this purpose which is suitable for younger school children.

didactics of biology - biology instruction - teaching media - botanical key - basic school - Czechoslovakia.
147311.

267

10.8.7 Basic scientific literature, literature concerning the didactics of biology

374. GULLIVER, R.L.:
Natural History Articles in 1981
Teaching Science, 1, 1984, No. 1, pp. 11-21.

The author provides a survey of various articles from the journals Country Life, Countryman, Country Quest, Countryside Monthly, The Field, Gamekeeper and Countryside, National Geographic, New Science in School and Wildlife, which can serve for biology instruction and which teachers can give students as material for assignments.

didactics of biology - biology instruction - literature - student assignments - Britain. 147311.

375. MÖLLER, E.:
Literatur zum Themenbereich Feuchtgebiete - Kleingewässer - Amphibien - Naturschutz (Literature on the subjects of wet areas, small scale waters, amphibians and nature conservation)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 3, pp. 110-111.

The author provides a selected bibliography on 50 books which concern the didactics of biology, the topics mentioned in the title and related problems.

didactics of biology - teaching media - bibliography - zoology - nature conservation - FRG. 147311.

10.8.8 Popular science literature and journals

376. KOCIK, Z.:
Współpraca nauczyciela biologii z biblioteka szkolna
(Cooperation between the biology teacher and the school library)
Biologia w szkole, 37, 1984, No. 1, pp. 57-58.

The author recommends making use of various books usually found in school libraries for giving pupils independent assignments on various topics, such as bees and their communities, spiders, fish atlases, atlases of amphibians, reptiles, birds and mammals. She discusses these assignments from the point of view of the didactics of biology teaching and demonstrates how books can be a highly productive teaching aid.

didactics of biology - biology instruction - teaching medium - literature - Poland. 147311.

10.8.9 Pupils´ notes

377. LITSCHE, G.:
Aufzeichnungen der Schüler als Mittel zum Zweck
(Pupils´ notes as a means towards attaining goals)
Biologie in der Schule, 33, 1984, No. 9, pp. 330-333.

Pupils learn when writing their notes, but especially afterwards, when they read them. The most important basic subject-matter should therefore be written down in the notes and should also be inspected by the teacher. The author describes his own experiences in this area and stresses the need to accent interdisciplinary relations and collective education.

didactics of biology - biology instruction - teaching media - pupils´notes - GDR. 147311.

10.9 Devices and instruments for biology instruction

378. O´NEILL, G.:
The construction of a simple phytoplankton sampler
The School Science Review, 65, 1984, No. 232,
pp. 502-504. Lit. 3, 3 figs.

The author provides instruction for making a simple device for collecting phytoplankton during excursions and field work. A drawing is added to make the instructions clearer.

didactics of biology - biology instruction - plankton - colletion - botany - Great Britain. 147311.

10.9.2 Devices and aids for experiments with natural objects

379. DEMCHICK, P.H.:
Taking Control of Chamber Humidity
The Science Teacher, 51, 1984, No. 7, pp. 29-31.
Lit. 4, 2 photos

The author describes methods for achieving control of the humidity in an incubation chamber when carrying out experiments with microbiological organisms and with plants. When glycerole is dissolved in water it prevents superfluous evaporation of water. While glycerole does not evaporate at all, the water is evaporated at a controlled rate. The author describes a whole system of different solutions which can be used in different cases for controlling humidity.

didactics of biology - biology instruction - teaching medium - experiments - microbiology - incubators - USA. 147311.

10.9.5 Devices for making images and reproducing sound, film projectors, episcopes, epidiascopes, slide projectors, overhead projectors, tape recorders and tape decks, radio sets, phonographs, radio-phonographs, combined projection facilities, control panels, video-cassette players and recorders

380. Einsatz von Dia- und Overheadprojector im experimentellen Biologieunterricht I (The use of slide projectors and overhead projectors in experimental biology teaching I.)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 3, pp. 91-94. Lit. 3, 2 figs.

Slide projectors and overhead projectors are highly necessary devices for biology teaching. There are meny uses they can be put to. They make the teacher´s work much easier. The article includes various instructions for the use of slide projectors and describes two experiments which can be done directly with an overhead projector: one concerns the Pulfrisch effect optical delusions and the second optomotorics. Pupils watch the course of these expetiments directly on an overhead projector.

didactics of biology - biology instruction - teaching medium - slide projector - overhead projector - experiments - FRG. 147311.

381. STORRER, J. - BÄSSLER, U. - AREND, D.:
Einsatz von Dia- und Overheadprojectoren im experimentellen Biologieunterricht III (The use of slide projectors and overhead projectors in experimental biology teaching III.)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 11, pp. 341-343. Lit. 2, 2 figs.

The authors describe the use of slide projectors and overhead projectors when demonstrating to pupils an absorption spectrum for chlorophyll and haemoglobin, fingerprints, diffusion osmosis, the respiration of a crayfish, etc.

didactics of biology - biology instruction - teaching medium - slide projector - overhead projector - experiments - observations - FRG. 147311.

10.9.6 Optical devices, magnifying glasses, mounted magnifiers, microscopes, electron microscopes, exposure-meters, stereomicroscopes

382. ECK, A.:
Bau eines Mess- und Zeigerokulars für die ROW-Schülermikroskops (Building a measuring device for a ROW student microscope)
Biologie in der Schule, 33, 1984, No. 2/3, pp. 93-94. 3 figs., 2 tabs.

The author describes his own experiences with a do-it-yourself method of making a measurement eyepiece for a ROW microscope used by pupils. He describes the materials he used, their adaptation and calibration. The eyepiece is used in classwork, for instance for the measurement of blood component size.

didactics of biology - biology instruction - teaching medium - microscopy - GDR. 147311.

383. SUNDBERG, M.D.:
Special Microscopy Using a Standard Student Microscope
The American Biology Teacher, 46, 1984, No. 2, pp.113-115.
Lit. 2.

The author describes opportunities for making use of a standard student microscope not only for the usual laboratory work and practical excercises done in high school, but also for special purposes, for instance with the use of polarized light, fluorescence and ultra violet rays, a dark field and other special techniques. When working with fluorescence it is necessary to wear protective eye glasses. The author also describes methods of adapting school microscopes for these purposes and where to buy the necessary material.

didactics of biology - biology instruction - microscopy - special methods - teaching medium - USA. 147311.

10.9.7 Areas devoted to instruction and storage of aids, biology workrooms, biology laboratories, biology storage rooms

384. EJSMONT, J. - OCHENDUSZKO, J.:
Wykorzystywanie pracowni biologicznych w szkolach wiejskich woj. bydgoskiego (The utilization of biology workrooms in the schools of the Bydgoszcz region)
Biologiea w szkole, 37, 1984, No. 1, pp. 24-30. Lit. 3, 8 tabs.

One of the basic prerequisites for the successful teaching of biology is the correct organization and full utilization of biology workrooms. Without them, the aims of biology teaching cannot be achieved. The authors provide information on a study project to determine how well biology workrooms are made use of in the Bydgoszcz region in Poland in 1982, which includes 25 village schools. The article sums up information on the number of pupils in the 5th classes of each school, how many of the schools have specialized biology workrooms, their size, number of cabinets, adequate blackboards, how many are equipped with aquariums, microscopes, insectariums, vivariums, radio sets, TV sets, tape recorders, cameras, slide projectors and overhead projectors. Only 25 % of the schools studied have the facilities to make use of modern teaching media. Also the number of chemicals available for class work was studied, instruments for various experiments, the situation of biology libraries, indoor plants and various mounted specimens.

didactics of biology - biology instruction - teaching media - biology workrooms - study of equipment - Poland. 147311.

385. HENNICKE, M.:
Effektives Lernen mit dem Mikroskop - für jeden Schüler (Efficient learning - with a microscope for each pupil)
Biologie in der Schule, 33, 1984, No. 6, pp. 215-221.

Learning to use a microscope is an important aspect of biology instruction. The author undertook a study of how well schools are equipped with microscopes and how the microscopes available are utilized in class work. The author stresses that each pupil should learn the skills required for using a microscope, that the activities of pupils with microscopes should be carefully supervised, pupils should receive marks and they should be given creative assignments which assume the use of a microscope.

didactics of biology - biology instruction - biology workrooms - microscopy - teaching media - GDR. 147311.

10.9.8 Mini-calculators, computers, micro-computers and teaching machines in biology instruction

386. ALESSI, S.M.:
Designing Effective Computer Assisted Instruction
The American Biology Teacher, 46, 1984, No. 3,
pp. 146-151.

The author offers comments on existing programs available for computer assisted instruction and stresses various aspects of biology teaching which should be taken into account when choosing a program. Also the problem of computer simulation is discussed and its use in class work.

didactics of biology - biology instruction - teaching medium - computer programs - teaching programs - USA.
147311.

387. BUDKE, V.:
Niektoré možnosti spätnoväzbovej práce na hodinách přírodopisu v 6. ročníku ZŠ (Some opportunities for feedback work in science lessons in the 6th class of basic school)
Přírodní vědy ve škole, 35, 1984-1985, No. 6, pp.208-209.

The draft of a new system for giving pupils marks in school will create conditions for improving the teaching and educational aspects of school work, but the theory and practice of marking a pupil´s achievement is still not satisfactory. The author describes new methods for assessing pupils on the basis of a feedback system and demonstrates this method on the basis of an examination where the pupil is asked about crayfish.

didactics of biology - biology instruction - teaching medium - teaching machine - pupils´marks - testing - Czechoslovakia - 147311.

388. CROVELLO, T.:
Computer Simulation in Bioeducation
The American Biology Teacher, 46, 1984, No. 1, pp.58-59.

The author discusses the problem of using simulation done by a computer for the purpose of biology instruction. As an example, he describes the simulation of Mendel´s laws of heredity in a specific group of individuals. He also describes new literature on this subject which will help the teacher to prepare programs for this purpose.

didactics of biology - biology instruction - teaching media - computers - simulation - genetics - USA. 147311.

389. KITA, J.:
Mikropočétač - prostriedok formy výučby
Učebné pomůcky ve škole a osvětě, 23, 1984, No. 9, p. 133, 2 figs.

The author describes the use of the French micro-computer CBM 8032 which is a part of the CBM 4032 system, as well as the CBM 4016 which is part of the CBM 4001 system. He describes opportunities for using this microcomputer in instruction. The machine weighs 22 kilos and is 43 x 48 x 37 cm in size.

didactics of biology - biology instruction - teaching medium - microcomputers - Czechoslovakia. 147311.

390. RÖPKE, R.:
Einsatzmöglichkeiten von Kleincomputern im Biologieunterricht (Opportunities for using microcomputers in biology instruction)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 11, pp. 344-347. Lit. 10, 6 figs.

The author demonstrates the use of computers in biology teaching. Small computers can be integrated into larger school systems. They are user friendly and have a large number of programs available for various teaching purposes. The example of the topic "predator - prey" is described as it is taught on the basis of a computer program.

didactics of biology - biology instruction - teaching medium - computer teaching programs - FRG. 147311.

11. Organizational forms of biology instruction

391. BONEVA, S.:
Prilagane na nakoy izvnklasni formi na rabota po biologiya (The use of extracurricular forms of work in biology)
Biologiya i khimiya, 27, No. 3, pp. 50-52.

Occasional extracurricular work in groups which is based on preliminary theoretical learning and concentrates on practical activities for the conservation of some useful species of animals is described in detail by the author. Specific projects concerning various species of ants and the ichneumon fly are described.

didactics of biology - biology instruction - organizational forms - extracurricular work - field work - nature conservation - insects - Bulgaria. 147317.

11.2.1 Laboratory work

392. **MELEAR, C.T.:**
Science Teaching Insights: A Laboratory Aide Training Program
The American Biology Teacher, 46, 1984, No. 4, pp. 81-86. Lit. 5, 5 figs., 3 tabs.

Preparing for laboratory classes makes high demands upon biology teachers. The author describes a project to train selected students as laboratory aides. Such students should have an interest in biology as a future subject of study. A table which sums up the obligations and duties of such aides and the principles according to which they work is provided; laboratory aides should undergo special courses on laboratory techniques.

didactics of biology - biology instruction - organizational form - extracurricula forms - laboratory work - USA. 147317.

393. TICHÁ, A.:
Laboratorní práce v 7. ročníku základní školy
(Laboratory work in the 7th class of basic school)
Přírodní vědy ve škole, 35, 1983-1984, No. 4,
pp. 131-132. 5 figs.

The author describes laboratory work done by pupils in the 7th class of basic school which concerns human biology. The experiments she describes concern determining the quantity of carbon dioxide produced when physical exertion occurs and the training of first aid with the help of a resuscitation puppet to which artificial "mouth to mouth" breathing is administered. A detailed description of various aspects of this project, done in a laboratory, are described.

didactics of biology - biology instruction - human biology - laboratory work - Czechoslovakia. 147317.

394. VLAKHOV, S.:
Mikrobiologichne izsledovanie na mlyako (The microbiological study of milk)
Biologiya i Khimiya, 27, 1984, No. 6, p. 3.

Milk is an excellent medium for the development of microorganisms and they can be easily studied in milk samples. Bacterial development occurs both under low and higher temperatures. Between 10 and 15 degrees C^{o} are temperatures best suited for psychrophilic bacteria; between 15 and 25 degrees C^{o} mezophilic organisms proliferate. Between 0 and 10 degrees C^{o} all bacterial processes are arrested, between 63 and 100 degrees C^{o} Pasteurization occurs. The author recommends the use of milk for experi-

ments to determine the number of bacteria in fresh milk, the observation of reductase in milk and determining the number of Coli bacteria in Pasteurized milk. Individual steps in this project are described in detail.
didactics of biology - biology instruction - microorganisms - laboratory work - Bulgaria. 147317.

11.2.2 Practical excercises in biology

395. BAMGE, W. - SCHEFFNER, W.:
Von phän zum Gen. Darstellung eines Wirkgefüges am Beispiel der Augenpigmentsynthese von Drosophila. Eine Unterrichtseinheit mit Praktikumsversuchen für den Leistungskurs Biologie (From external characteristics to genes. Explaining gene structures and their effects on the basis of the example of eye pigment synthesis in the Drosophila fly. A thematic unit with experiments for practical exercises in biology in the upper classes of secondary school)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 9, pp. 261-269. Lit. 6, 9 figs., 1 worksheet.

On the basis of the example of the fruit fly, Drosophila melanogaster, the author explains the controlling function of genes in individual steps of synthesis reaction. The didactical and methodological aspects of teaching this subject-matter are developed in detail. Experiments during practical exercises concern the synthesis of eye pigment and assume the use of paper chromatography.

didactics of biology - biology instruction - organizational form - experiments - genetics - chromatography - insects - FRG. 147317.

396. REED, M.D.:
Nature conservation: a practical exercise in making decisions
The School Science Review, 66, 1984, No. 234, pp.75-78.

The author provides an outline of a practical exercise devoted to nature conservation. Students, on the basis of studying the relevant theory concerning the interdependency of various phenomena, are asked to simulate decisions and formulate criteria which concern nature conservation. The author provides instructions for this project, describes the field work connected with it and discusses how the work of individual students should be assessed.

didactics of biology - biology instruction - organizational form - practical exercises - field work - nature conservation - Great Britain. 147317.

11.2.3 Hobby clubs

397. KHACHATURYAN, R.M. - SIMONAN, O.P.:
Kak shkolniki Armenii ucheastvuyut v borbe s erosiey pochvy (How pupils in Armenia participate in the struggle against soil erosion)
Biologiya v shkole, 58, 1984, No. 1, p. 71.

A study of the possibility of preventing soil erosion by water in specific geographical conditions can be an important experimental project suitable for school children and represents one of the basic methods for developing nature conservation activities among school pupils in Armenia. School experiments in this area can be put to important practical uses. Pupils also plant shrubs and trees at the base of mountains. Interdisciplinary relations with geography and other subjects are stressed.

didactics of biology - biology instruction - organizational forms - hobby clubs - nature conservation - soil erosion - Armenia - USSR. 147317.

398. MISZCZUK, K.:
Hodowla i obserwacja rozwoju jadwabników w kole biologicznym (The breeding and observation of silk worms in a biology hobby club)
Biologia w szkole, 36, 1984, No. 2, pp. 113-117.
Lit. 21, 1 tab.

The author describes the biology and importance of the silk worm (Bombyx mori L.). Its breeding is seasonal, it carries very low costs and requires minimum care. This type of project is suitable for young people or old-age pensioners. The demand for natural silk in the textile industry is increasing, the prices it brings on world markets are rising; by the cultivation of the silk worm it might be possible to decrease imports of silk. The author describes his experiences with this type of work in normal classes and in biology hobby clubs for which he draws up a detailed plan of activities.

didactics of biology - biology instruction - organizational form - hobby club - breeding - insects - Poland. 147317.

399. ŠKODOVÁ, H.:
Včelařský zákon z Lanžhota (The Bee Keeping Law in Lanžhot)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 19. pp. 8-9. 3 figs.

The author describes the history of bee-keeping in this country, the existing number of bee-hives and the organization of bee-keepers. The Czech Union of Bee Keepers has 1 086 chapters (in 1983) with the South Moravian region as the region with the largest number of bee-keepers: 16 691. Also the activities of pupils´ hobby clubs devoted to bee-keeping in the district of Lanžhot are described, as well as the history of bee-keeping in this region.

didactics of biology - biology instruction - organizational forms - hobby clubs - bee-keeping - history - Czechoslovakia. 147317.

11.2.5 Activities in extracurricular educational facilities

400. STEGERER, A.:
Arbeitsteiliger Gruppenunterricht - aufgezeigt am Thema: Welche Aufgaben haben die Schwungfeder beim Fliegen? (Group work instruction - on the basis of the example of the role of tail feathers in birds for their flight)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 1, pp. 9-20. Lit. 4, 2 figs., 5 worksheets and 15 figs.

The author describes how group forms of work can be used in the lower classes of secondary school in biology instruction. Pupils receive individual assignments and in groups they then carry out observations, descriptions, comparions, experiments and make models, etc. The author describes work concerning the topic "Birds" and specifically the structure and function of their tail feathers in flight. This description is given in detail.

didactics of biology - biology instruction - organizational form - group instruction - ornithology - FRG.
147317.

11.2.8 Work on experimental school plots of land

401. KUZNECOV, V.I.:
Kolkhoz i shkola - edinoe tseloe (Collective farm and school - one whole)
Biologiya v shkole, 58, 1984, No. 6, pp. 66-69.

The author is the chairman of the "10th Anniversary of October" collective farm in the Smolensk region. He acquaints readers with the long-term cooperation which exists between the kolkhoz and the local secondary school. Various specialists working in the collective farm teach at the school and/or participate in various activities organized by the school and members of the school´s teaching staff participate in various kolkhoz activities. Pupils participate in all stages of crop production, while the farm helps to equip the school. Various specific examples of this cooperation and the various activities undertaken within its framework are described; all educational activities have the aim of influencing pupils to make a vocational choice which will lead to their employment in their native region.

didactics of biology - biology instruction - school plot of land - organizationa form - kolkhoz - USSR.
147317.

11.3.1 Excursions, hiking camps, field work

402. ČERNÝ, J.:
Chov kladrubských koní (Breeding horses at Kladruby)
Přírodní vědy ve škole, 35, 1983-1984, No. 8, p. 292.

The article describes the long history of the horse breeding farm at Kladruby in Bohemia. In 1978 it celebrated the 400th anniversary of its founding. The author also describes famous studs from this farm (Rubino, Pepoli, Generale), the breeding of pedigree stallions and mares and the breeding of race horses which are exported and also sold for sports in Czechoslovakia. This farm is highly suitable for a school excursion.

didactics of biology - biology instruction - organizational form - horse breeding - excursion - Czechoslovakia. 147317.

403. EBEL, C. - KLOSS, M. - SCHWARZ, G.:
Vorschläge für die Durchführung der biologisch-geographischen Exkursion - Klasse 9 (Suggestions for carrying out biological and geographical excursions in the 9th class)
Biologie in der Schule, 33, 1984, No. 2-3, pp. 87-90.

The purpose of combined biological and geographical excursions is to carry out observations, to study ecological relations in nature and to acquaint pupils with them. On the basis of their own experiences the authors describe various alternatives for such excursions and discuss in detail the organizational and methodological aspects of their preparation. The greatest attention should be paid to providing pupils with individual assignments in advance of the excursion.

didactics of biology - biology instruction - organizational forms - excursions - interdisciplinary relations - geography - FRG. 147317.

404. KAZMIERCZYK, A.:
Jak realizuje niektóre zalozenia wychowawcze na lekcjach biologii w klasie VIII ? Wicieczka do zakładu dzieci uposledzonych (How some educational prerequisites are implemented in biology lessons in the 8th class. An excursion to an institution for mentally retarded children)
Biologia w szkole, 37, 1984, No. 2, pp. 107-109.
1 photo.

Among the aims of teaching and education is making it possible for every person to participate in work for the good of society, as well as for one's own benefit and for developing one's own abilities. For this reason pupils should learn to care for their own health, as well as that of others, to achieve an awareness of the need to care for and conserve the environment and to acquire skills required to understand causal relations in nature, to be able to study natural phenomena and to understand and behave according to the principles of hygiene. In the 8th class sex education, the ethical and social importance of the family, education against alcohol drinking and drug abuse, as well as care of the pregnant etc., are all part of the biology curriculum. In this context an excursion to a home for mentally retarded children proved to be very useful for 8th class pupils. The author discusses the outcome of the excursion.

didactics of biology - biology instruction - organizational form - excursion - human biology - 8th class - Poland. 147317.

405. KEOWN, D.:
Let's Justify the Field Trip
The American Biology Teacher, 46, 1984, No. 1, pp.43-48.
Lit. 5, 2 photos, 3 figs.

The author defends and justifies the importance of field trips from the point of view of the didactics of biology teaching. He demonstrates his opinions on the basis of an example of a field trip to carry out ecological observations on the northern and southern slopes of hills, where students measure the temperature of the soil, the air, the strength of the wind, its direction, the moisture of the soil, the pH factor in the soil, its relative moisture, the angle of sun rays, intensity of light, the species of plants, animals and microbes found, and other data for making useful comparisons.

didactics of biology - biology instruction - organizational form - excursion - field work - ecology - comparisons - USA. 147317.

406. KUS, E.:

Zahrada zvířat dětem (The zoological garden for children)
ABC mladých techniků a přírodovědců, 28, 1983, No. 18, pp. 16-17. 5 photos.

In 1983 the Prague Zoological gardens had 149 species of mammals, 230 species of birds, 41 species of reptiles, 8 species of amphibians, 35 species of fishes and 27 species of insects and other invertebrates. The author also provides information about the breeding successes this zoo has had during the most recent year and recommends it to teachers as a place to which pupil excursions should be organized.

didactics of biology - biology instruction - organizational form - zoological garden - excursion - Czechoslovakia. 147317.

407. ODZUCK, W.:

Die Vegetation als Mittel zur Standortbeurteilung
(Vegetation as a means for assessening a locality)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 6, pp. 170-176. Lit. 9, 4 figs., 4 tabs.

The author describes methods for assessing a locality by studying its vegetation. Specific plants are usually indicative of a specific type of locality and hence during an excursion their identification can be the key to carrying out ecological studies. The author provides a survey of factors and their relationship to plants and vegetation in general. Various plant species have various values as proof of specific types of locality.

didactics of biology - biology instruction - organizational form - excursion - vegetation - ecology - FRG. 147317.

408. POKORNÝ, M.:

Exkurze do lesní továrny (An excursion to a forestry factory)

Věda a technika mládeži, 38, 1984, No. 23. pp. 724-725. 2 photos.

The author describes an excursion he organized with his pupils to a tree nursery at the Central Bohemian Forestry Enterprize at Brandýs nad Labem, which has large tree nurseries on an area of 85 hectars; it expects to have 102 hectars of tree nurseries at the end of the present five-year plan. Both conifers and deciduous trees are cultivated. The author describes modern methods of cultivating saplings and discusses methods for organizing a productive excursion with pupils.

didactics of biology - biology instruction - organizational form - excursion - tree nursery - Czechoslovakia. 147317.

409. SIMONSMEIER, J.:
Bericht über eine mehrtägige ökologische Excursion in die Alpen von Schüler einer 12. Klasse (Report on an ecological excursion of several days into the Alps with 12th class pupils)
Der Biologieunterricht, 20, 1984, No. 1, pp. 40-50.
Lit. 5, 4 figs.

Ecology has become an indispensable part of the biology curriculum. This subject of course requires field work and excursions where pupils can work on their individual assignments. The author discusses the status of ecology in school curriculum and the tasks that it has. The subject itself is a difficult one and assumes making use of interdisciplinary relations. The place to which an excursion is organised should be chosen very carefully. A place with the least number of anthropogenic factors is probably best suited. The author describes how he selected an adequate biota at least six months in advance, to provide sufficient time for adequate preparations. In the Alps pupils studied the vegetation found on the southern slopes of Oberen Rotgüldensee. They studied plant communities, anthropogenic factors, individual biotas, they measured the temperature of the soil, of the air, water, the speed of the wind, the course of changes in the weather in various biotas, the amount of sunlight, etc. The excursion is described and assessed in detail.

didactics of biology - biology instruction - organizational form - excursion - ecology - Alps - FRG.
147317.

11.3.2 Socially beneficial work, voluntary work done by pupils

410. **Navstrechu shkolnoy trudovoy** (An encounter with work in school)
Biologiya v shkole, 58, 1984, No. 3, pp. 3-6.

During the summer approximately 14 million school children worked in the fields and on the farms of collective farms and state farms in the Soviet Union, in agricultural and industrial combines, in industry and in the services. Pupils cultivate fruits and vegetables for school dining rooms on experimental plots of land belonging to schools and they carry out experiments on the basis of instructions from specialists. They are also active in planting greenery in the vicinity of schools. In 1984 the Soviet Union celebrated the 30th anniversary of the beginning of such work by groups of pupils.

didactics of biology - biology instruction - organizational form - socially beneficial work - USSR. 147317.

11.4 Biology Olympiads, biological competitions

411. MICEK, W.:
Testy na konkursy biologiczne (Tests in biology competitions)
Biologia w szkole, 37, 1984, No. 3, pp. 172-181.
17 figs.

The author describes biology competitions organized in the Krakow region since 1974. These competitions have two year cycles, as far as subject-matter is concerned. The author provides a test for these competitions concerning the subject-matter "Life in fresh water" and also a test concerning the territorial distribution of organisms useful for preparations for the 6th Biology Olympiad.

didactics of biology - biology instruction - organisational form - biology olympiad - Poland. 147317.

412. SKOWRÓNSKI, Z.:
Z dóswiadczen koła biologicznego przy liceum ogólnokształcym w Wolsztynie (Experience with biology hobby club activities at the general education secondary school in Wolsyztyn)
Biologia w szkole, 37, 1984, No. 3, pp. 167-172.

The author describes the history of a biology hobby club which has continually been active at the general education secondary school in the town of Wolsztyn since 1950. Every year members of the hobby club participate in various biological competitions and also in Biology Olympiads. 40 - 50 pupils from the school annually participate in some biology competition. The author describes how hobby club activities contribute to their preparations for the competitions and also the independent assignments the pupils undertake for this purpose.

didactics of biology - biology instruction - organizational form - hobby clubs - biology olympiad - Poland. 147317.

11.6 Individual, independent homework

413. KLEIN, V.:
Zum aktuellen Thema. Durch Lebensverbundene Aufgaben- und Problemstellungen die selbstständigen Schüler anregen (On a current topic. Independent work by pupils based on assignments concerning everyday problems should be supported)
Biologie in der Schule, 33, 1984, No. 9, p. 342.

On the basis of the example of the topic "Infectious disease yesterday and today" the author demonstrates how pupils can be led to be more active in class and to work on independent assignments which are based on their own experiences and every-day life. Pupils can for instance prepare brief communications on the course of infectious diseases they themselves have encountered. The author describes the questions a teacher can ask to create a problem situation, which is then discussed in class.

didactics of biology - biology instruction - organizational form - homework - independent work - problem teaching - GDR. 147317.

414. MYAGKOVA, A.N. - BROVKINA, Y.T. - REZNIKOVA, V.E.: Soderzhanie i organizatsiya domashnikh zadaniy i ikh rol v normalizatsii uchebnoy nagruzku uchashchikhsya (The content and organization of homework and their role in the normalization of the learning load of pupils)
Biologiya v shkole, 58, 1984, No. 6, pp. 29-33.

The authors discuss the problem of pupils´ homework. The main purpose of homework is to assure the permanency of their knowledge of basic subject-matter they have acquired and learning the skills taught during the lesson in class. Homework should contribute not only to learning knowledge, but also to the creation of the required skills. In homework assignments, pupils should use textbooks, their illustrations and should carry out various analytical and synthesizing activities. Attention should be devoted to the manner in which homework tasks are formulated, as well as the various instructions pupils are given. Homework should be connected to the subject-matter taught and should also represent an introduction to subject-matter which will be taught in subsequent lessons. Assignments given should stress independent work and develop pupils´ active cognitive activities. The time required for the homework should always be taken into account. Pupils must learn to always do their homework, which should always be verified in class.

didactics of biology - biology instruction - organizational form - homework - USSR. 147317.

11.8 Field work and summer natural science activities, science trails

415. DOBRETSOVA, N.V.:
Usilenie ekologicheskogo podchoda v organizatsii narutalisticheskoy raboty v pionerskom lagere
(Strengthening an ecological approach in the organization of natural science work carried out in Young Pioneer summer camps)
Biologiya v shkole, 58, 1984, No. 3, pp. 57-60.

The author discusses the problem of developing an ecological approach in natural science activities organized in Young Pioneer summer camps. In her opinion teachers should participate in the activities of these camps, where pupils undertake various socially beneficial work, work connected with nature conservation, collect specimens which can be brought back to school and also learn about nature directly outdoors.

didactics of biology - biology instruction - organizational form - summer camp - ecology - USSR. 147317.

416. JACOBSEN, H.P.:
Schülerexpeditionen (Pupils' expeditions)
Biologie in der Schule, 33, 1984, No. 11, pp. 425-427.

Since 1980 the Young Natural Scientist and Technician Station at Neuruppin has been organising expeditions of pupils from the 6th to 12th grades, who are members of biology hobby clubs. These expeditions take two weeks and allow a closer affinity between school and work activities and hence make an important contribution to the objectives of communist education. The author describes in detail the preparations and organization of these expeditions and the experiences he has gained with their implementation.

didactics of biology - biology instruction - field work - organization - GDR. 147317.

417. STUBBE, M.:
Säugetierkartierung der DDR - arbeiten Sie mit!
(Mapping the mammals of the GDR - cooperate with us!)
Biologie in der Schule, 33, 1984, No. 2-3, p. 107.

Creating a detailed map of the incidence of animals in the GDR serves several surposes. Some orders of animals have already been mapped (amphibians, some orders of insects, birds). Mammals began to be mapped 10 years ago and at that time over 1 000 persons from various institutions participated in the project. The new mapping discussed in this article should show how the territorial distribution of mammals has changed during the last 10 years. The author here appeals to biology teachers to participate in this project together with their pupils, specifically with those who are members of biology hobby clubs. He also provides instructions on how to go about helping in this project.

didactics of biology - biology instruction - organizational form - field work - mapping - mammals - GDR. 147317.

11.9.2 Individual instruction

418. MAKARA, S.:
Komiks forma pracy indywidualnej (Comics as a form of individual work)
Biologia w Szkole, 36, 1984, No.2, pp. 98-99.
1 fig.

The author describes the possibility of using popular comics as a teaching medium. Pupils like to read comics. The author himself has drawn comics on the following subjects: "How funci damage green plants" and "Mildew in the mite kingdom". The author stresses that reading the comics should be followed by a discussion, where pupils speak about what they have learnt.

didactics of biology - biology instruction - organizational form - individual instruction - Poland. 147317.

12. Planning biology instruction

419. **MYAGKOVA, A.N. - BROVKINA, Y.T. - REZNIKOVA, V.E.:** Rol planirovaniya v normalizatsii uchebnoy nagruzki uchashchikhsya po biologii (The role of planning in the normalization of the learning load of pupils) Biologiya v shkole, 58, 1984, No. 2, pp. 27-32.

The authors discuss basic approaches to various methods of planning instruction, while taking into account the need to normalize pupils´ work loads and avoid overburdening them. From the point of view of the didactics of biology they recommend a detailed preparation of a thematic plan, which would include plans for individual teaching lessons and reducing the amount of subject-matter taught, as assumed by the new teaching syllabus, which places special stress on basic subject-matter; they also recommend the preparation of questions for pupils, the development of interdisciplinary relations and planning the use of various teaching media. As far as plans for individual lessons are concerned, it is necessary to concentrate on difficult problems, excercises for strengthening knowledge and effective ways of verifying pupils´ knowledge and skills.

didactics of biology - biology instruction - teaching loads - thematic plan - interdisciplinary relations - USSR.

147317.

12.2 Preparations of teachers for instruction, for teaching lessons and for other organizational forms of biology instruction, teaching strategies

420. KUMERICS, M.:

Anleitung zur Entwicklung von Lernstrategien für den Biologieunterricht in der Sekundarstufe II. (Instructions for creating learning strategies in biology teaching in the upper classes of secondary school) Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 4, pp. 97-117. Lit. 21, 9 figs., 9 worksheets, 1 test.

When more difficult subject-matter is taught pupils should be able to create their own learning strategy. The article demonstrates how psychology and the didactics of biology can be used to deal with special biological topics. The author suggests a nine lesson unit devoted to learning and learning strategies. In individual lessons pupils prepare for various topics, learn about the methodology used by scientific biology, about the psychology of learning, learning strategies in relation to pedagogical psychology, types of learning, degrees of memory, memory and learning strategies and how thinking can be blocked by stress.

didactics of biology - biology instruction - psychology - learning strategy - FRG. 147317.

12.2.1 Preparations for botany instruction

421. DAINBRIDGE, J.W.:
Aesculus hippocastum in war and peace
Journal of Biological Education, 18, 1984, No. 1,
pp. 65-69. 4 photographs, 2 tabs.

The article is addressed to biology teachers and can be used for independent work by pupils when carrying out a botany assignment. It concerns the plant Aesculus hippocasum, which during the war was used as a food substitute, but now is used as an interesting object of botany instruction. The author describes the plant's biology and morphology.

didactics of biology - biology instruction - botany - gymnosperms - Britain. 147317.

422. CARROIR, G. - GIRAUD, M.:
Histoire de connaissances sur la truffe (The history of studying the truffle)
Biologie, Géologie, 71, 1984, No. 3, pp. 619-632.
3 figs.

The culinary properties of truffles have been known for a long time, but because they grow underground, their biology was until recently not well understood. The authors cite the most recent findings concerning this edible saprophytic ascomycetous subterranean fungi of the genus Tiber which concern its morphology function, growth and how it can be conserved. Truffles are not parasites; the authors explain their life cycle. It is not possible to cultivate them in the laboratory.

didactics of biology - biology instruction - botany - fungi - France. 147317.

423. GRÜSCHOW, J.:
Vorschläge zur Behandlung des Unterrichtsstoffs "Bedeutung der Photosynthese", Klasse 12
(Suggestions for teaching the topic "The significance of photosynthesis" in the 12th class)
Biologie in der Schule, 33, 1984, No. 11, pp. 417-420.

One of the problems of biology teaching is to continue in subject-matter taught previously. This also concerns the topic photosynthesis which is taught in the 9th class and then again in the 12th class. In this article the author describes her own procedures. She stresses the need to increase the amount of independent work done by pupils, the use of discussions and problem teaching and opportunities for using seminar forms of instruction.

didactics of biology - biology instruction - botany - plant physiology - photosynthesis - 9th class - 12th class - GDR. 147317.

424. KAMRIN, A.A. - LAVAN, J.S.:
Demonstrating Osmosis and Anthocyanins Using Purple Onion
The American Biology Teacher, 46, 1984, No. 2, pp. 116-117. 3 photos.

Osmosis can best be demonstrated on purple strains of onions which moreover provide opportunities for demonstrating the distribution of anthocyanins in the plant organism. Experiments with plasmolysis and deplasmolysis can demonstrate the basis of changes in pH value; with pH at 2 the anthocyanins are reddish purple and with a pH value of 4.5 they are blueish purple.

didactics of biology - biology instruction - borany - plant physiology - plasmolysis - USA. 147317.

425. MOROZOVA, V.F.:
K formirovaniyu u uchashchikhsya znaniy o stroenii tsvetka. (On teaching pupils about the structure of flowers in botany instruction in the 5th class)
Biologiya v shkole, 58, 1984, No. 2, pp. 32-33.
1 fig., 2 outlines

Pupils learn about the structure of flowers during their first botany lessons in the 5th class. They have for this purpose an independent lesson and two laboratory exercises. The author stresses the importance of this topic and makes various recommendations concerning the use of the textbook, its illustrations and other pictures, as well as a discussion on this subject and giving pupils assignments. Also the use of a blind outline of a flower can be used where pupils fill in the correct names of various morphological flower components.

didactics of biology - biology instruction - botany - 5th class - plant morphology - USSR. 147331.

426. POKORNÝ, M.:

Pro nové lesy (For new forests)

Věda a technika mládeži, 38, 1984, No. 20, pp. 620-622. 5 figs.

The forests are rapidly disappearing all over the world. Attempts are being made to save them and to conserve existing growths. The author describes problems connected with a renewal of forests. He describes mycorrhizae, an association of a fungus and a higher plant in which the fungus lives within or on the outside of the roots, forming a symbiotic or parasitic relationship, which was already observed in 1881 by F.M. Kamerski and which was described in 1885 by B. Frank. The Institute for Landscape Ecology of the Czechoslovak Academy of Sciences is now developing a program for forest renewal with the utilization of microorganisms and is making a mycellium in granulated innoculations which is used when the seeds of shrubs and trees are cultivated in greenhouses.

didactics of biology - biology instruction - botany - forests- ecology - nature conservation - plant physiology - Czechoslovakia. 147331.

12.2.2 Preparations for zoology instruction

427. ALTMANN, A.:
K tématu "Vývojově nižší savci" (On the topic "Developmentally lower mammals")
Přírodní vědy ve škole, 35, 1983-1984, No. 8,
pp. 282-285.

The author develops a topic taught in the 6th class of basic school which concerns those mammals which are at a lower development level. This topic is important from the point of view of phylogeny. The author analyses the didactics of the topic, the teaching aids which should be used, deals in detail with the Monotreme and the Marsupialia and cites a number of examples, which are interesting for pupils.

didactics of biology - biology instruction - basic school - zoology - mammals - Czechoslovakia. 147331.

428. ALTMANN, A.:
Motýli (Butterflies)
Přírodní vědy ve škole, 35, 1983-1984, No. 10,
pp. 366-367. 19 photos.

The author deals with this subject from the point of view of teaching in the 6th class of basic school. Butterflies are one of the most important bioindicators which signal the degree of environmental pollution. They are among the first to disappear from a threatened biota and they deserve all measures which can be taken for their conservation. They should be "hunted" only with cameras. The author also describes in greater detail a total of 19 daytime and nocturnal butterflies and provides their photographs, which are on the magazine cover.

didactics of biology - biology instruction - zoology - insects - basic school - environmental conservation - Czechoslovakia. 147331.

429. BARBER, S.:
Introducing Jelly-fish
Teaching Science, 2, 1984, No. 1, pp. 22-26. 5 figs.

The author provides interesting facts about jelly-fish for zoology studies. He concentrates on the jelly-fish Aurelia aurita, its biology, stages of life, the ciliation of its larvae and its strobilation or asexual reproduction. The article can be used by teachers when preparing for class, or by pupils when working on independent assignments.

didactics of biology - biology instruction - zoology - Coelenterata - marine animals - Britain. 147331.

430. CAMPAN, R.:
Le développement du comportement (The development of behaviour)
Biologie - Géologie, 71, 1984, No. 3, pp. 646-664. 18 figs.

Ethology is based on two sources - the biological, which studies the behaviour of individual animals and the psychological, which is based on experimental psychological studies of animals in the laboratory. The author provides several definitions of ethology and its subject-matter, according to various scholars and discusses the relation between a genotype and behaviour, as well as the development of behaviour during the embryonic and post-natal period. A large section of the article is devoted to behaviour mechanisms. On the basis of various scientific studies he demonstrates food seeking behaviour in laboratory rats under various conditions and situations. The large number of drawings which accompany the article make it highly suitable for use in teaching ethology in secondary school.

didactics of biology - biology instruction - zoology - ethology - secondary school - experiments - observations - France. 147331.

431. GRZGÓLKA, K.:
Właściwe wykorzystanie czasu wolnego od pracy. Komspekt lekcji dla klasy IV. (Making good use of leisure time. The outline of a lesson in the 4th class of secondary school.)
Biologia w szkole, 37, 1984, No. 1, pp. 41-43. 1 fig.

The author provides an outline for a lesson in the fourth grade of secondary school which, according to the teaching syllabus, should deal with the problem of making good use of leisure time and the importance of active recreation and contacts with nature for the healthy development of the individual. Teaching media and the course of the lesson are described in detail.

didactics of biology - biology instruction - human biology - recreation - active recreation - Poland. 147331.

432. HLÁSEK, J.:
Naši obojživelníci (Our amphibians)
Přírodní vědy ve škole, 35, 1983-1984, No. 1, pp. 8-10.
Lit. 5, 19 photos.

The author provides an outline of biology syllabus subject-matter concerning amphibians in Czechoslovakia. He discusses their biology and frequency of incidence and the threats they are exposed to as a consequence of environmental pollution. He also describes various species of caudated and salient amphibians and the biology of the Edible frog in greater detail.

didactics of biology - biology instruction - zoology - amphibians - nature conservation - environmental conservation - Czechoslovakia. 147331.

433. KRÁL, Z.:
Tajemství poštovních holubů (The secrets of homing pigeons)
ABC mladých techniků a přírodovědců, 28, 1984, No.21, p. 28-29. 5 photos.

Homing pigeons have been serving man for over 5 000 years. The first documentation we have comes from Ancient Egypt, around the year 3000 B.C., when the pharaoh Ramses II used homing pigeons for communication purposes when at war. The rich Rothschild family made its fortune thanks to receiving early information about Napoleon´s defeat at Waterloo, which was accomplished by a homing pigeon. The author describes how homing pigeons find their way: they have a dual orientation system and other auxilliary perception and they know how to combine various information from these sources available to them. They are capable of reacting to very small changes in atmospheric pressure and they are able to feel digressions from the Earth's magnetic pole. It has been found that during periods of solar eruptions they are prone to mistakes in finding their way. The main point of orientation for them is the sun. They also have built-in clocks and a built-in magnetic compass, dependent on the sun. They are also able to find their way on the basis of clearly visible points of orientation in the landscape. The author also describes various tricks used by pigeon breeders and how pigeon races are organized. This article is suitable for use in teaching in the 6th class of basic school or in hobby club activities.

didactics of biology - biology instruction - zoology - ornithology - 6th class - bird breeding - Czechoslovakia. 147331.

434. KUNZ, T.H.:
Halloween Treat: Bat Facts and Folklore
The American Biology Teacher, 46, 1984, No. 7,
pp. 394-399. Lit. 3, 8 figs.

The author describes facts and fiction on the Chiroptera or bat order, about which writers of fiction or the mass media have generated incorrect information and many prejudices. Bats had a prominent place in the folklore of the ancient Egyptians, the Incas, among the natives of Africa and in China, where bats were a symbol of good luck and joy. The food different species of bats eat is highly varied, there are species specialized for eating insects, meat, plants, there are those that suck blood or nectar, eat fruit, leaves, fish, frogs, reptiles, birds or small mammals. Their activities, nesting and social life are described, as well as their reproduction. The majority of bats live in polygyny. The author also describes the number of young which bats have, their size, locomotion, echolocation, migration and hibernation. Bats have a relatively long life span, they live up to an age of 30 years. The author also describes how they can be caught and how they can be preserved and mounted for use in schools.

didactics of biology - biology instruction - zoology - 6th class - secondary school - mammals - Chiroptera - USA. 147331.

435. LANC, V.:
Nebojte se zmijí (Don´t be afraid of the Viper snake)
ABC mladých techniků a přírodovědců, 28, 1983-1984,
No. 22, pp. 6-7, 2 photos.

Only the Vipera berus specie of Viper snakes lives in Czechoslovakia. The author describes its biotas. The poisonous teeth of the Viper snake take two to three weeks to grow again, new teeth grow behind the old ones. During a year the Viper snake will catch and devour an average of 60 microtines. Since 1945 no person has died as a consequence of Viper snake biting in this country. The author describes how to treat a Viper snake bite and where and why snake serum must be administered. This article is highly suitable for zoology instruction in the 6th class.

didactics of biology - biology instruction - zoology - reptiles - snakes - Czechoslovakia. 147331.

436. MARTINOVÁ, Z. - PLETICHA, P.:
Akce Riparia (The Riparia project)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 18, pp. 8-9, 3 photos.

The authors describe how a hobby club composed of pupils in basic school undertook saving a colony of Sand martins which nested in an abandoned sand quarry near the town of Žatec. They worked under the supervision of their teacher and Dr. Pleticha, an officer of the local chapter of the Union of Nature Conservationists. At the same time the pupils undertook practical ornithological studies.

didactics of biology - biology instruction - zoology - ornithology - hobby club - nature conservation - Czechoslovakia. 147331.

437. PAPÁČEK, M.:
K problematice základního didaktického modelu hmyzu
(Concerning the problem of a basic didactical model of an insect)
Přírodní vědy ve škole, 35, 1983-1984, No. 4, pp. 127-130. Lit. 16, 1 fig., 2 tabs.

The author describes and discusses a didactical model of an insect, which aims at including all important characteristics of this order of animals. A generalized model can then be made more specific on the basis of simplified descriptions of the cockchafer, stick insect, locust, cockroach and honey bee.

He also describes the biology of these species and how they should be taught in biology class and in practical exercises. They can usually be easily collected and mounted as specimens.

didactics of biology - biology instruction - zoology - insects - didactical model - Czechoslovakia. 147331.

12.2.3 Preparations for instruction in human biology

438. Bojovníci s morem (Those who fought the plague)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 21, p. 13, 13 appendixes, 1 fig.

A summary article on the plague, its history and how mankind has combated it. The plague was first described by the Japanese Kitasato and by Jersin. In 1903 C. Rothschild discovered the Plague flea which carries the infection to people. The article also describes how vaccination against the plague was discovered and plague epidemics which occurred in Bohemia. Also spotted typhus fever is described and how its carrier was discovered by the Czech physician S. Prowazka, who died in 1916. Another related disease is Rocky Mountain spotted fever, whose carrier was described by H.T. Ricketts who died in 1910. Both Prowazek and Ricketts died of the diseases they combated.

didactics of biology - biology instruction - human biology - infectious diseases - Czechoslovakia. 147331.

439. BUCHWALD, C.E.:
Human Ecology - A First Lesson
The American Biology Teacher, 46, 1984, No. 8,
pp. 330-333. Lit. 6, 1 photo.

While world population is growing at exponential rates, the world consumption of non-renewable resources is growing very rapidly so that the natural biochemical and biological equilibrium which exists in the world is deteriorating. The first and second laws of thermodynamics continue to be our best guide to studying the problem of world resources and energy. Human ecology should be taught as the problem of world materials and energy resources, biochemical cycles, thermodynamics and population growth.

didactics of biology - biology instruction - human economy - human biology - renewable resources - unrenewable resources - USA. 147331.

440. DYLLA, K.:
Humanbiologie im Kurs - auch ein Erprobungsbericht
(Human biology as part of a teaching course -
a report on a study)
Praxis der Naturwissenschaften - Biologie, 33, 1984,
No. 2, pp. 33-44. Lit. 15, 6 figs., 6 worksheets,
5 tabs., 1 appendix.

The study which the author reports on concerned pupil reactions to various topics concerning human biology. It also concerned the interest pupil expressed in various fields of biology and various current problems. Among the topics pupils were most interested in were problems of acid rain, as well as cancer, the relation between good health and sports and problems of environmental pollution and nature conservation.

didactics of biology - biology instruction - study - pupil interests - human biology - nature conservation - FRG. 147331.

441. HÖRZ, H.E.:
Eizeltransplantation beim Menschen als moralisches Problem (The transplantation of human eggs as a moral problem)
Biologie in der Schule, 33, 1984, No. 4, pp. 155-156.

Socialism considers women to have the right to freely decide about their own bodies. Marriage and the family are no longer subject to economical pressures. This, however, makes it even more difficult for a woman who cannot have children. The possibility of transplanting fertilized eggs opens up new opportunities in this area, but at the same time can lead to moral conflicts among married couples and even to divorce. In no case, however, should such transplantation be looked upon as the buying and selling of children, as playing genetic games or as trading in genetic material. The moral qualities of medicine should be in accord with the moral qualities of the population. People should be the subject, not the object of science.

didactics of biology - biology instruction - human biology - transplantations - GDR. 147331.

442. MAIHÖFER, W.:
Erfahrungen zur Weiterentwicklung von Fähigkeiten der Schüler der Abiturstufe im Stoffgebiet Physiologie (Experience with developing the abilities of pupils for learning physiology in the final classes of secondary school)
Biologie in der Schule, 33, 1984, No. 12, pp. 466-470.

The author discusses the necessary prerequisites for successfully learning biology in the final classes of secondary school. Their basic prerequisite is the effective utilization of knowledge gained in primary school. Also instruction should be carefully planned and should include analyses of the subject-matter taught from the point of view of world-view development. Special attention is given to experimental aspects of instruction and the importance of using experiments in biology class.

didactics of biology - biology instruction - experiments
GDR. 147331.

443. GRUMBACH, C. - KRUMBACH, K. - NAROSKA, V.:
Das Welternährungsproblem unter besonderer Berücksichtigung der Eiweissversorgung (World nutritional problems with special attention to acquiring sufficient proteins)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 10, pp. 332-343.

Mankind faces a challange concerning the pressing need to deal with the problem of nutrition. A number of endeavours in this area have failed and the urgency of the problem is increasing. This problem should also be included into the teaching syllabus for school biology. The main problem the world faces is acquiring and consuming the required amount of proteins. Pupils should learn about the longterm consequences of protein insufficiency and about possible alternative sources of proteins. In the year 2 000 there will be 6 billion people throughout the world, which will mean a 50 % to 60 % higher consumption of proteins in comparison to today. At present between one and one and a half billion people suffer from hunger and 10 to 15 million people die annually, every 10th person is threatened by hunger and 300 to 400 million people suffer from diseases which are the direct consequence of insufficient protein intake. The author suggests devoting two teaching lessons to learning about the consequences of protein insufficiency and two lessons devoted to finding alternative sources of protein, for instance from sea weeds.

didactics of biology - biology instruction - human biology - proteins - developing countries - FRG. 147331.

444. MICHNIK, M.:
Wybrane problemy patologii człowieka (Selected problems of human pathology)
Biologia w szkole, 36, 1984, No. 2, pp. 67-73.

The author analyses the notions of good health and disease. Health is a state of the human organism characterized by equilibrium with the biosphere and without the presence of pathological changes in the biological, mental and social state of a person. Disease means that the structure and function of the organism have been damaged due to the influence of external or internal factors and this is accompanied by a break down in the adaptive mechanism of a person. Among the most important civilizational diseases are diseases of the circulatory system and cancer.

didactics of biology - biology instruction - human biology - sickness - health - civilizational disease - Poland. 147331.

445. PROVAZNÍK, J.:
Dospívání (Adolescence)
Věda a technika mládeži, 38, 1984, No. 10, pp.304-307.
1 photo, 2 figs., 1 tab.

The author provides information on the physiology of adolescence, i.e. on the changes taking place in the human body at puberty. While a number of things are explained, numerous mechanisms are dealt with insufficiently. The author deals in detail with hormones and the factors which "trigger" puberty. Intensive participation in sports tends to retard the start of puberty.

didactics of biology - biology instruction - human biology - puberty - hormones - Czechoslovakia. 147331.

446. SCHNEIDER, J.:
Ist der Mensch ein territoriales Wesen ? (Is man a territorial creature ?)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 2, pp. 33-47. Lit. 17, 10 figs., 4 worksheets, 3 tabs.

Within the framework of human ethology the author discusses whether humans are also territorial creatures, various forms of human territorial behaviour, the size of territory staked out by humans, as well as the influence of these aspects in an urban environment. He also discusses this problem from the point of view of the biology teaching syllabus and comes to the conclusion that this problem should be included in class work. During an urban excursion pupils can make observations and perhaps also carry out some experiments on how humans react in specific situations concerning territory. Territoriality is an important component of cultural behaviour and may be a source of aggresive behaviour in humans. The author cites various examples of territorial behaviour in man.

didactics of biology - biology instruction - human biology - ethology - territoriality - FRG. 147331.

447. ŠLÉGL, J.:
Výživa, pověry a náboženství (Nutrition, superstitions and religion)
Přírodní vědy ve škole, 35, 1983-1984, No. 4, pp. 124-127, Lit. 13.

A contribution to atheist education within the framework of instruction in human biology. The author cites several examples which can be used to make instruction more atractive and interesting. He describes the struggle against superstitions and prejudices, the majority of which are of Church origin. Some religious superstitions still exist, even if their content has changed. Some superstitions which concern the area of nutrition are cited.

didactics of biology - biology instruction - human biology - atheist education - nutrition - Czechoslovakia. 147331.

12.2.4 Preparations for instruction in general biology, genetics, ecology, molecular biology, ethology, the history of biology

448. BRETZ, P.:
Der Brief des Mr. Scott. Familienanalyse als Einsteig in die Vererbungskehre (A letter from Mr. Scott. A family analysis of genetics)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 9, pp. 315-318. Lit. 3, 1 draft of transparency, 1 tab., 1 worksheet.

A genetic analysis of a single family can provide suitable motivation for genetics teaching, especially if it is combined with problem teaching. Here the author describes a letter from a Mr. Scott dated 1777, which makes it possible to draw up a family tree to study the laws of heredity on the basis of various human characteristics. In this case the author deals with total colour-blindness (Daltonism), which existed in the Scott family.

didactics of biology - biology instruction - genetics - Daltonism - motivation - FRG. 147331.

449. COCHRANE, W. - DOCKERTY, A.:
The Teaching of DNA Replication in Schools: Thirty Years On, Thirty Years Out of Date?
Journal of Biological Education, 18, 1984, No. 1, pp. 25-28. Lit. 21, pp. 25-28, 1 fig., 1 tab.

By a simplification of the subject-matter of DNA replication in schools a situation now exists where the majority of students do not understand the process and thereby also do not understand the basic techniques of genetic engineering. The author provides an explanation of DNA replication suitable for use in schools and attempts to do away with the half-truths of gross simplifications which are so frequent in connection with this topic.

didactics of biology - biology instruction - general biology - genetics - micromolecular biology - DNA replication - Great Britain. 147331.

450. GEIGER, J.R.:
Genetic Engineering - An Introduction to Two Special ABT Issues
The American Biology Teacher, 46, 1984, No. 7, pp. 365-372. Lit. 28, 1 photo, 5 figs., 1 tab.

The author provides an outline for teaching about genetic engineering from various aspects, specifically about the future of the pharmaceutic industry, about problems of human peptide hormones, more efficient methods of producing anti-biotics, new drugs against cardio-vascular disease, decreasing our dependency on petroleum as a raw material in the food processing industry, new strains of plants with lesser requirements for fertilization, new vaccines for cattle and also various strategies for cancer prevention, which are all dealt with in two special issues of the American Biology Teacher.

didactics of biology - biology instruction - genetic engineering - USA. 147331.

451. HÖGERMANN, C.:
Selektion durch Anpassung an die Umwelt - selektionals Evolutionsfaktor (Selection by adaptation to the environment and selection as an evolutionary factor) Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 10, pp. 351-353, 1 fig.

An interesting alternative to the well known game on evolution where selection is the main evolutionary factor. This material is suitable for use with an overhead projector - the game uses large geometrically shaped figures made of coloured foil. The author provides information on how to make the game, and how it can be played and made use of in biology class work.

didactics of biology - biology instruction - phylogeny - selection - didactical game - overhead projector - FRG. 147331.

452. LETKO, E.:
Je talent dědičný ? (Can talent be inherited ?)
Přírodní vědy ve škole, 35, 1983-1984, No. 9, pp.325-328. Lit. 6.

Talent is only partially determined by genetics. But the fact that hereditary factors do have a role to play is evident from the history of some families. The author discusses what is and what is not hereditary and discusses talent from this point of view. Talent as a characteristic which is partially hereditary can develop only when the hereditary factor is in harmony with optimum conditions provided by the environment.

didactics of biology - biology instruction - human biology - genetics - talent- Czechoslovakia. 147331.

453. RUBACHEVA, L.I.:
K izucheniyu tem "Zakonomernosti izmenchivosti" i "Selektsiya rosteniy, zhivotnikh i mikroorganizmov" v X. klasse (On teaching the topics "The laws of variability" and "The selection of plants, animals and microorganisms" in the 10th class)
Biologiya v shkole, 58, 1984, No. 1, pp. 35-41.
Lit. 10, 3 figs.

According to the teaching syllabus the topic "The laws of variability" has five lessons devoted to it and the topic "The selection of plants, animals and microorganisms" is taught in 6 lessons. The author provides an outline on how to divide this subject-matter into individual lessons and describes for each lesson a suitable didactical and methodological approach with references to the subject-matter taught in the 9th class. Also various teaching media suitable for these topics are cited, as well as laboratory work and the use of the textbook; more detailed explanations for difficult parts of the subject-matter are also provided.

didactics of biology - biology instruction - general biology - Darwinism - variability - selection - 10th class - USSR. 147331.

454. SEHMRAU, W.:
Erfahrungen bei der didaktisch-methodischen Gestaltung der Stoffeinheit "Aus der Geschichte der Abstammungslehre" (Experience with a didactically conceived thematic unit "From the history of evolutionary theory")
Biologie in der Schule, 33, 1984, No. 4, pp.129-132.

On the basis of visits to classrooms and on the basis of his own experience the author provides an outline for the subject cited in the title. He cites facts, their interpretations and various activities for the teacher and his pupils for three teaching lessons. Special stress is placed on the social sources in the development of evolutionary theory. Also teaching aids are mentioned.

didactics of biology - biology instruction - history of theory - general biology - evolutionary theory - GDR. 147331.

455. ZARKOVA, L.:
Izpolzovane na sistemno-strukturniya podkhod pri prepodavane na temite "Organizatsiya na kletkata" v deseti klas (The utilization of a system and structural approach to teaching the topic "The organization of the cell" in the 10th class)
Biologiya i khimiya, 37, 1984, No. 6, pp. 26-31, Lit. 7, 3 figs. 1 tab.

The thematic unit dealt with in this article concerns the organization and function of the cell and is taught in the 10th class. It is divided into 5 teaching lessons: 1) the general principles of the organization of cellular cytoplasma and biological systems, 2) cytoplasma, cellular membranes and organelles, 3) plastids, 4) the nucleus, 5) the transformation and exchange of matter between a cell and its surrounding environment.

13. The outcome of biology instruction

456. ETSCHENBERG, K. - GERHARDT, A.:
Was sollen Schüler der Sekundarstufe im Fach Biologie lernen. Überlegungen aus aktuellen Anlass (What should pupils in secondary school learn in biology. Comments on a timely topic)
Naturwissenschaften im Unterricht - Biologie, 32, 1984, No. 4, pp. 121-127. Lit. 2, 2 figs.

The authors comment on the necessity of re-writing the biology teaching syllabus for the 5th to 10th classes. In their opinion this subject should be divided into 10 parts where each would deal with various aspects of the life of organisms. The draft of this approach has been verified several times and can easily be introduced into the curriculum; the subject-matter taught in the lower and upper classes of secondary school relate to each other very well. For the 5th class the authors suggests "The variety of living nature and movement", for the 6th class "Reproduction and development", for the 7th class "Metabolism of living organisms", for the 8th class "Control and regulation in living systems and the mutual interconnection of various aspects of life" and for the 9th and 10th classes "Ethology", "Genetics" and "Evolution".

didactics of biology - biology instruction - 5th to 10th class - teaching syllabus - curriculum - general biology - pupil requirements - FRG. 147331.

457. LENOCHOVÁ, M.:
Výsledky overovania nového modelu biologie v 2. ročníku gymnázia (The outcome of verifying a new model of biology instruction in the 2nd class of general education secondary schools)
Přírodní vědy ve škole, 35, 1983-1984, No. 6, pp. 202-204.

The author provides information about the verification of a new biology teaching syllabus which was tested in 5 schools. The outcome of a similar study concerning the 1st class have already been published. The testing concerned the teaching syllabus and the use of experimental tests, exercises and methodological handbooks. The results were obtained on the basis of tests given to pupils. The findings are cited in percentages.

didactics of biology - biology instruction - general education secondary school - study of teaching syllabus - experiments - methodological handbooks - Czechoslovakia.

13.1 Testing results achieved in biology instruction, repetitions strengthening, systemization and structuralization of subject-matter, surveys of subject-matter

458. HORN, G.:

Einige Erfahrungen zur langfristigen, kontinuierlichen Vorbereitung der Abschlussprüfung (Some experience with long-term and continuous preparations for school-leaving examinations)

Biologie in der Schule, 33, 1984, No. 9, pp. 328-330.

The author describes her own experiences with preparing pupils for school-leaving examinations in the 10th class of general education secondary school and also experience she gained during visits to classrooms. She begins with preparations already in the 9th class by acquainting pupils with the subject-matter of the final examination and by drawing up a plan of systematic repetitions. She also describes assignments given to pupils which aim at an application of knowledge and skills and the systemization of what has been learnt.

didactics of biology - biology instruction - school-leaving examination - repetitions - GDR. 147331.

13.2 Assessment of results achieved in biology instruction

459. GOLLE, B.:
Auswertung der schriftlichen Abschlussprüfung 1982-1983
(An assessment of the written part of the school-leaving examination in the 1982-1983 school year)
Biologie in der Schule, 33, 1984, No. 1, pp. 7-9.

The author carried out an assessment of 2500 written school-leaving examinations. Of the total analysed, 59 % of the pupils had selected biology as the elective test subject; 50 % of these pupils achieved the same marks in the school-leaving exam as they had achieved during the course of the school year. In chosing subject-matter, it was again confirmed that the pupils´ most popular topics are those taught in the 8th class (especially "Respiration"), while such topics as "Genetics" were chosen only by 15 % of the pupils. In comparison to previous years the ability of pupils to carry out mental operations had improved. The author also discusses how well pupils understand basic biological terms, causal relations and the effect of natural laws, as well problems connected with the application of knowledge and skills.

didactics of biology - biology instruction - written examinations - assissment of pupils - GDR. 147331.

460. **MARSISKE, H.:**
Ergebnisse und Schlussfolgerungen einer Untersuchung des Bewertungsverhaltens von Fachlehrern (The findings and conclusions of a study on how teachers behave during assessment of pupil achievements) Biologie in der Schule, 33, 1984, No. 5, pp. 172-174.

The importance of testing pupils has many times been stressed. When studying this activity among biology teachers the following items were studied: mimicry and gesticulation, verbal assessment with various degrees of stress, assessment by other pupils. The study was carried out in a basic school, during 31 lessons in the classroom. It was found that for instance 42 - 46 % of all pupils' activities were assessed by teachers, while in only one case did pupils assess their achievements mutually. In the final part of the article the author draws various conclusions relevant to the very-day activities of schools.

didactics of biology - biology instruction - pupil assessment - GDR. 147331.

13.4 Outcome of biological competitions and creative work by young people in biology

461. HROUDA, A.:
Úspěšná přehlídka SOČ v Praze (A successful survey of Student Scientific Activities in Prague)
Přírodní vědy ve škole, 35, 1983-1984, No. 3, p. 89.

A municipal round of Student Scientific Activities in biology and geology was held in Prague on May 18th and 19th, 1983 at the general education secondary school in Botičská street in Prague 2, where the most successful student work was presented. A total of 30 students participated in the municipal round; 20 were from general education secondary schools, 3 from secondary vocational schools and the remainder were a group from MSMP.

didactics of biology - biology instruction - biological competition - Czechoslovakia. 147331.

462. ZABEL, E. - HEINZEL, I.:
Ernst-Haeckel - Schülerpreis 1983 (The E. Haeckel Student Prize for 1983)
Biologie in der Schule, 33, 1984, No. 4, pp.142-144. 1 fig.

The E. Haeckel Prize has been annually awarded by the Biological Society of the German Democratic Republic for over ten years. in 1983 it was for the first time awarded in the town where E. Haeckel worked and lived. The authors provide a survey of all 6 entries which were awarded prizes.

didactics of biology - biology instruction - biological competition - biological society - GDR. 147331.

14. The biology teacher, outstanding biology teachers

463. MEITLAND, L.:
When the Teacher's Away, the Students Will Learn
The American Biology Teacher, 46, 1984, No. 5,
pp. 275-278, Lit. 11, 1 worksheet.

The author discusses the problem of what to do when a biology teacher becomes ill. Can the substitute teacher fill in ? In most cases also problems with discipline develop. The author therefore suggests that each teacher record a lesson on some interesting topic on an audiovisual cassette, including questions for pupils and making contact with the class. The substitute teacher can then play this cassette in class. Also assignments for pupils should be recorded, and worksheet provided. Among the topics suitable for such occasions are "A heart attack", "Saving whales", "Smog as a fatal environmental factor". The radio station WNYE in New York City also offers such recordings, which also include questions and assignments for students.

didactics of biology - biology instruction - biology teacher - substitute teacher -audiovisual teaching media - USA. 147305.

14.1 Demands made of a biology teacher

464. KOPLÍK, J.:

O potřebě vzdělávání učitelů přírodovědných předmětů v informatice (On the need to educate biology teachers in information theory)

Přírodní vědy ve škole, **35**, 1983-1984, No. 8, p. 291.

The scientific and technological revolution is also making a strong impact upon the natural sciences, where the amount of knowledge acquired is increasing and accelerating. It has become indispensable to use computers for acquiring and processing information. Teachers are not yet, however, prepared or trained to use computers. They should therefore receive training in this area, to make it possible for them to use computers in class.

didactics of biology - biology instruction - biology teacher - computer - information science - Czechoslovakia. 147305.

14.2 Teacher training in normal, inservice and post-gradute study courses at pedagogical and natural science faculties

465. Spezialkurse für die Weiterbildung in Biologie
(Special courses for further education in biology)
Biologie in der Schule, 33, 1984, No. 9, pp. 343-345.

During the winter and summer vacations in 1985 special courses will be organized for biology teachers. The following courses are planned: An introduction to ethology; An introduction to the biology of behaviour; Field work in ecology - practical aspects; Selected problems of the didactics of biology; Environmental conservation; Selected problems of human genetics; Experiments in genetics; Microbiology and the environment; The plant cell; Modern methods of plant physiology; Taxonomy; Biologically effective compounds; Biology instruction at the Zoo; School biology techniques. For each course, its purpose is cited, as well as date and who it is organized by.

didactics of biology - biology instruction - further education of techers - GDR. 147305.

14.3 Public activities undertaken by teachers, work in district pedagogical societies, in regional pedagogical societies, biology supervisors, visits to class by supervisors

466. RÄUBER, A.:
Kurzlehrgänge der Biologischen Gesellschaft der DDR (Brief courses organized by the Biological Society of the GDR (School biology section))
Biologie in der Schule, 33, 1984, No. 2-3, p. 97.

In 1984 various courses for the further education of biology teachers are planned. They include the following: Current problems of ecology and environmental conservation; Biology teaching in the Zoo; Evolutionary theory. For each of these courses the author cites the date, brief content and institution organizing the course.

didactics of biology - biology instruction - biology teachers - biological society - GDR. 147305.

14.6 Pedagogical readings

467. GEHLHAR, K.H. - HORN, F.:
Pädagogische Lesungen 1984. Beiträge zur optimalen Entwicklung aller Schüler (Pedagogical readings 1984. Contributions to the optimum development of all pupils)
Biologie in der Schule, 33, 1984, No. 12, pp. 449-453.

The Institute for the Further Education of Teachers in Leipzig, together with the Pedagogical University in Halle organized on February 6th to 9th 1984 a pedagogical reading session. A total of six papers were read and discussed in the Biology Section; the authors provide brief surveys of all of them. They included problem of differentiating among pupils, elective subjects, interdisciplinary relations between biology and civilian defense, the use of a microscope and the importance of excursions for developing a love of nature in pupils.

didactics of biology - biology instruction - biology teacher - pedagogical readings - GDR. 147305.

14.7 Meetings, conferences, congresses, specialized committees, seminars, meetings of specialists in the didactics of biology

468. CICHY, D.:

V Konferencji Dydaktykow biologie szkol wyszych
(The 5th conference of specialists in the didactics of biology, working in higher education)
Biologia w szkole, 36, 1983, No. 2, pp. 124-125.

From September 18th to 24th 1983 the 5th conference of specialists from higher learning met at the M. Kopernik University in the city of Torun. The main organizer of the meeting was the Institute for the Didactics of Biology of the Polish M. Kopernik Natural Science Association; 50 persons from Poland and guests for the GDR, FRG and Austria also participated. Among the problems discussed were the terminology used by the didactics of biology, the didactics of biology as a science, the general framework of the biology teaching syllabi used in the 5th to 10th classes and the terminology used in the FRG.

didactics of biology - biology instruction - conference - terminology - Poland. 147301.

469. ILLIG, H.:
Erhaltung und Schutz von Ackerwildpflanzen
(The conservation and protection of wildly growing field plants)
Biologie in der Schule, 33, 1984, No. 7-8, p. 305.

On March 27th, 1984 the first meeting of the section on geobotany and phytotaxonomy of the Biological Society of the GDR met in Berlin. Also present were representatives of the Central Institute for Ancient History and Archeology, as well as representatives of other disciplines. The purpose of the meeting were discussions concerning the rise and development of wildly growing field plants and the conservation of field weeds, which are threatened with extinction due to modern agricultural methods.

didactics of biology - biology instruction - conference - weeds - nature conservation - botany - Poland. 147301.

470. PLESSE, W.:
23. Kühlungsborner Kolloquium zu philosophischen Problemen der Natur- Technik- und mathematischen Wissenschaften (The 23rd Kühlungsborn colloquium devoted to the philosophical problems of the natural, technical and mathematical sciences)
Biologie in der Schule, 33, 1984, No. 7-8, pp.303-304.

This colloquium was held from March 26th to 30th, 1984. The first paper was devoted to an assessment of the development concept of I. Prigogin, and others were devoted to "relative objectives" and to "time". Other papers presented included the history of the relationship between Marx-Leninist philosophy and the natural, technical and mathematical sciences.

didactics of biology - biology instruction - conference - philosophy - technical sciences - mathematical sciences - GDR. 147301.

471. TIMOFEEVA, V.K.:
Vsesoyuznoye sovešhchanie - seminar zavedushchikh kafedrami biologicheskikh disciplin pedagogicheskikg vuzob strani (An All-Union meeting and seminar of chiefs of departments of biological disciplines at pedagogical higher education institutions)
Biologiya v shkole, 58, 1984, No. 3, pp. 78-79.

The meeting was convened by the Ministry of Higher and Specialized Education together with the Ministry of Education of the USSR. It concerned improvements in the methods and forms used in the education of future biology teachers and the tasks which departments of biological sciences, as well as pedagogical higher education in general, have in fulfilling the tasks set forth in the conclusions of the XXVIth Congress of the USSR. Also future outlooks for higher and specialized education were discussed, as well as problems of rural schools and other problems.

didactics of biology - biology instruction - conference - higher education - biology teachers - USSR.
147301.

472. ZICHÁČEK, V.:
XX. dny školní biologie (The 20th conference on school biology)
Přírodní vědy ve škole, 35, 1983-1984, No. 6, p. 210.

On October 15th to 18th, 1984, the 20th conference on school biology was held in Jena in the GDR. The conference was organized by the section for school biology of the Biological Society of the GDR. Among the problems discussed at the conference were the assessment of pupils' knowledge and skills, the comprehensive development of a pupil's personality and others. The author provides a survey of individual papers presented at the conference.

didactics of biology - biology instruction - conference - pupil development - assessments - GDR.
147301.

14.9 Outstanding biology teachers, anniversaries, deaths

473. GOLOVINSKI, E.:
Asen Zlatarov - zhivot, smrt, bezsmertie (Asen Zlatarov - his life, death and immortality)
Biologiya i khimiya, 27, 1984, No. 2, pp. 5-13)

The article is devoted to the memory of a professor at the University of Sofia, Asen Zlatarov, at the occasion of the one hundreth anniversary of his birth. He was an outstanding Bulgarian scientist, science educator and also a poet. The author analyses some of his immortal thoughts.

didactics of biology - biology instruction - science educator - anniversary - Bulgaria. 147305.

474. STSIDERSKAYA, M.D.:
Tak rabotayet uchitel - metodist (This is how a teacher who is an expert in methodology works)
Biologiya v shkole, 58, 1984, No. 4, pp. 57-58.

The author acquaints readers with the long teaching career of Z.A. Lukyantsova, a biology teacher at a secondary school in the Lomonosov district of the Leningrad region who has received many rewards and honors. Her experience has been presented at various conferences and courses, as well as at pedagogical readings and at the Leningrad Regional Institute for the Education of Teachers, with which she cooperates. There she carried out model biology lessons for the benefit of beginner teachers. Her school plot of land is the best in the whole region and makes a contribution to the Food Program of the USSR. She also runs a model biology stock room.

didactics of biology - biology instruction - biology teacher - USSR. 147305.

15. Articles with information on scientific biology

475. FLANNERY, M.C.:
The Element of Surprise
The American Biology Teacher, 46, 1984, No. 2, pp.125-128.

The author is a biology teacher at St. John's University in Jamaica. She cites a number of topics which are suitable to further motivate learning biology and stresses an element of surprise. Her comments concern methods of assessing men and women, bacteria as crystalizing centres for ice on the surface of plants, carcionogenic plants, the behaviour of bees, termites and sex hormones.

15.1 Botany

476. AKSENOVA, N.A.:
Shipovnik (The hip rose)
Biologiya v shkole, 58, 1984, No. 3, pp. 17-20.

Of the 250 known species of the genus Rosaceae (roses), over 80 are found on the territory of the USSR. The author deals in detail with the morphology of the hip rose, its variability, the chemical composition of its fruit and the use it can be put to. She also describes various varieties of the hip rose which are cultivated on plantations in various parts of the USSR and which among others also serve as a raw material for pressing rose oil. Also the cultivation of hip roses on school plots of land and in orchards are discussed, as well as their use in the pharmaceutical industry and in cosmetics.

didactics of biology - biology instruction - Rosaceae - USSR. 147355.

477. BALTUS, J.:
Kolik je léčivek (How many medicinal plants are there)
Věda a technika mládeži, 38, 1984, No. 13, pp. 404-405.

Approximately 150 medicinal herbs are processed industrially in Czechoslovakia and every 5th drug produced in this country is plant based. Throughout the world people make use of approximately 700 species of plants for making various drugs and teas. The author discusses the history of medicinal herbs and plants and describes the centre for medicinal plants at the J.E. Purkyně University in Brno, which coordinates activities in this field for the whole country. He also describes the activities of a hobby club which is interested in medicinal herbs at the secondary school in the town of Havlíčkův Brod.

478. ČECHOVÁ, A.:
Jak rostou banány (How bananas grow)
Věda a technika mládeži, 38, 1984, No. 5, pp. 146-147.
5 photos.

The author describes the cultivation of bananas on the Canary Islands. The specie cultivated there is called Musa cavendischii and is highly productive. Bananas contain 22 % sugar and are rich in vitamins. The banana is a tropical plant, its leaf sheath forms a trunk-like structure which is up to six meters high. The sex of flowers is separated, there are male and female flowers; the male flowers are cut off to increase the productivity of the female flowers. Bananas are propagated in a vegetative manner. A cluster of bananas weighs up to 60 kilograms and contains approximately 150 individual bananas. After the banana harvest the plants dry up and new shoots are planted. Banana plantations require not only a humid warm climate, but they must also be irrigated.

didactics of biology - biology - botany - tropical fruit - bananas - basic school - Czechoslovakia.
147355.

479. HARTMANN, H.J.:
Die Genese der heutigen Vegetation Mitteleuropas unter dem Aspekt der Verzahnung von ökologischen und kulturgeschichtlichen Faktoren (The development of existing vegetation in Central Europe from the point of view of complementary ecological, cultural and historical factors)
Der Biologieunterricht, 20, 1984, No. 3, pp. 4-32.
Lit. 15, 11 figs., 3 tabs.

This article was written for students in the upper classes of general education secondary schools and deals with the historical, geographical and biological development of existing flora and vegetation in Central Europe. Also the period when man appeard in this area and his impact on vegetation are described.

didactics of biology - biology - botany - vegetation - Central Europe - history - plant communities - upper classes - secondary school - FRG. 147355.

480. KROPTOVA, I.I.:
Yadovitiye rasteniya (Poisonous plants)
Biologiya v shkole, 58, 1984, No. 3, pp. 60-61.

During outdoor excursions and field trips pupils may encounter poisonous plants. The author in this article acquaints readers with 15 species of poisonous plants which are most frequently encountered in the European part of the USSR. He also describes the poisonous substances found in these plants and how to provide first aid in case they are ingested and poisoning occurs. Some of these plants are used in medicine and for this purpose are cultivated or collected. Their importance and effects are described.

didactics of biology - biology - botany - poisonous plants - excursions - field work - USSR. 147355.

481. TIKHONOV, J.B.:
Lekarstvenniye rasteniya Moskovskoy oblasti, ikh zagotovka i okhrana (Medicinal plants found in the Moscow region - their collection and conservation) Biologiya v shkole, 58, 1984, No. 4, pp. 17-20.

Approximately 95 different medicinal plants grow in the Moscow region and twenty of them are cited in the Red Book of threatened species; picking them is strictly forbidden. Another 20, which are not among threatened species, are collected by school children. The author discusses the annual plan of collecting medicinal plants for 1984 and the species most in demand. Also methods used for their drying are described and various recommendations given.

biology - botany - medicinal plants - nature conservation - Red Book - USSR. 147355.

15.2 Zoology, ethology

482. BLACKWELDER, R.S. - GARCIAN, G.S.:
Are There Really Animals Like That ? Animals That Transplant Organs
The American Biology Teacher, 46, 1984, No. 2,
pp. 116-117. 1 fig.

Organ transplants are now carried out in man, as well as in laboratory animals in which the mechanism of acceptance of the transplanted organ and surgical techniques are studied. Some organisms have, however, learnt to steal living organs from other animals (other species) and than use them in their own bodies. This phenomenon exists in turbellariae, in the Ribbon worm and in crustaceans. The authors describe in detail how such transplants occur, on the basis of the example of the crustacean Peltogastrella gracilis.

Biology - zoology - general biology - organ transplants - invertebrates - Czechoslovakia. 147357.

483. BORGESOVÁ, M.:
Denní rozvrh zvířat (Animals' daily schedule)
ABC mladých techniků a přírodovědců, 28, 1983-1984,
No. 1, p. 2, 2 appendixes, 1 photo.

Day-time and nocturnal animals maintain very ridgid schedules. Predators for instance, sleep a long time (16 to 20 hours a day), while herbivorous animals sleep a short time (2 to 3 hours). Omnivorous animals tend to sleep during the night, like man. During the day animals have a schedule of activities during which they devote time to preening, bathing, devoting care to their territory, to travel and to the education of the young by physical exercises and play. Also the daily regimen of domestic pets is described.

Biology - zoology - ethology - daily schedule - Czechoslovakia. 147357.

484. **FELIX, J.:**
Ostrovy opic (Monkey islands)
Věda a technika mládeži, 38, 1984, No. 9, pp. 308-309.
4 photos.

Monkeys have a role to play in medicine, i.e. in scientific research. Among the most frequently used are the cercopithecidae from Asia and Africa, the Asian Rhesus monkeys and African Long-tailed monkeys. The best known of them are the Rhesus (with the rH factor). They have become a protected specie in India, because so many have been caught and sold. The prices of monkeys are constantly rising. Czechoslovakia cooperates with Vietnam which is attempting to introduce its own monkey breeding stations. A large station has been openned on the Monkey Islands which are in the Bay of Dragons, north of the town of Ha Long. A colony of over 500 Rhesus monkeys lives here (Macaca mulata).

biology - zoology - mammals - monkeys - Vietnam - Czechoslovakia. 147357.

485. HABROVÁ, V. - NEDVÍDEK, J.:
Význam a perspektívy přenosu embryí u savců
(The significance and future of embryo transfers)
Přírodní vědy ve škole, 35, 1983-1984, No. 7, pp. 244-245.

The author describe techniques by which the embryos of bovine cattle, horses, and pigs are transplanted (transfered) with the aim of improving the quality of farm animals. Two of the techniques most frequently used are described in detail and the usefulness of these measures are discussed from an economic and biological point of vies.

biology - zoology - embryo transfer - animal breeding - Czechoslovakia. 147357.

486. HAGEN, E.:
Die umfassende ökologische Bedeutung der Hummeln - Erhaltung- und Schutzmassnahmen (An extensive study of bumble-bees - their conservation and protection)
Praxis dër Naturwissenschaften im Unterricht - Biologie, 33, 1984, No. 6, pp. 176-183. Lit. 25, 5 figs., 1 master for copying.

The author first discusses the place of bumble-bees in the ecosystem and points to the causes of the fact that they have become a threatened specie. Also the development cycle and biologiy of the buble-bee is described and possibilities for breeding this insect are discussed. In the Federal Republic of Germany all specie of buble-bees are in the Red Book. This article is suitable for biology hobby club members.

biology - zoology - entomology - breeding insects - hobby club - nature conservation - FRG. 147357.

487. HARMATA, W.:

Z zagadnien orientacji przestzennej ptakow i nietoperzy (Some problems of the spatial orientation of birds and bats)
Biologia w szkole, 37, 1984, No. 3, pp. 142-148.
Lit. 8.

The author deals with a problem from the ethology of birds and bats, specifically their ability for spatial orientation in the landscape, especially during the time of bird migration. The author deals with the history of the problem, describes various research in this area and the prevailing opinions of scientists on this matter at present.

biology - zoology - Chiroptera - birds - orientation - ethology - Poland. 147357.

488. HLÁSEK, J.:

Proč se od nás vytratil mandelík (Why the Common roller is no longer seen here)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 17, p. 7.

The coraciadiformes order of birds, which includes the Common roller (Coracias garrulus) is today found only exceptionally in southern Slovakia, although previously it was much more frequent and more widely spread. The author considers the main reasons for the decrease of this beautiful bird to be changes in the environment which have occured, specifically the integration of fields into large units and the fact that large hallow trees suitable for nesting are no longer found. This bird eats insects, locust, mole crickets and others.

biology - zoology - ornithology - nature conservation - Czechoslovakia. 147357.

489. HORNÍK, F.:

Feromóny v zemědělské praxi (Pheromones in agricultural practice)

Přírodní vědy ve škole, 35, 1983-1984, No. 9, p. 380.

Pheromones are olfactory and gustatory substances which help animals to find their way in the landscape then seeking food, to seek individuals of the same specie and to avoid their natural enemies. The author describes pheromones in insects and in mammals. They are made use of in biologically combating harmful insects and in zoo-technology when swine copulation is organized.

biology - zoology - orientation - pheromones - breeding - Czechoslovakia. 147357.

490. YORDANSKIY, N.N.:

Biogenticheskiy zakon i problema vzaimnootnoshenii ontozeneza i filogenera (Bio-genetic laws and the mutual relationship between ontogeny and phylogeny)

Biologiya v shkole, 58, 1984, No. 6, pp. 19-25.

In 1984 one hundred and fifty years has passed since the birth of E. Haeckel, an outstanding scientist who developed the study of evolution and formulated bio-genetic laws which also concern biogeny and phylogeny. The author describes the history of that law and the contribution made by Russian and other European scientists to it. He especially stresses the interesting contribution made by A.N. Severtsev.

biology - general biology - zoology - phylogeny - biogenetic laws - E. Haeckel - USSR. 147357.

491. KHOLOVÁ, H.:
Soumrak velikánů (The demise of the giants)
ABC mladých techniků a přírodovědců, 28, 1983-1984,
No. 1, pp. 16-17, 4 photos.

Of the 350 species of Proboscidae, only two species have survived, the Asiatic elephant (Elephas maximus) and the African elephant (Loxodonta Africana). The author describes various specie of Proboscidae at the beginnings of human history. He also describes various existing sub-species, such as the Malay, Ceylonese, Bengal, South African and East African elephants. The most widespread at present is the African bush elephant which has a gestation period of 22 months and cows nurse the calves for 2 to 3 years. A single cow may have as many as 7 to 8 offsprings in a lifetime. Elephants now live mostly in reservations. They are killed mostly by poachers looking for ivory tusks.

biology - zoology - mammals - Proboscedae - nature conservation - Czechoslovakia. 147357.

492. KURKA, A.:
Jedovatí živočichové I. (Poisonous animals - part I.)
Přírodní vědy ve škole, 35, 1983-1984, No. 5,
pp. 166-167. 21 photo.

The author discusses poisonous animals from the point of view of the health hazard they represent. He recommends teaching about them, their ethology and habitat. However, there are many superstitions about poisonous animal. The author cites various scientific work done on this topic, which is usually considered to be very interesting by students.

biology - zoology - poisonous animals - Czechoslovakia. 147357.

493. KURKA, A.:
Jedovatí živočichové II. (Poisonous animals part II)
Přírodní vědy ve škole, 35, 1983-1984, No. 6,
pp. 204-208. 16 figs.

The author here provides a systematic survey of the most important species of poisonous animals among the invertebrates including flagellates, fungi, ribbon worms, molluscs, annelidae, arthropoda and echinodermata. The animals are described in detail from the point of view of biology and of possible encounters with man.

- biology - zoology - poisonous animals - invertebrates - Czechoslovakia. 147357.

494. KURKA, A.:
Jedovatí živočichové III. (Poisonous animals - part III)
Přírodní vědy ve škole, 35, 1983-1984, No. 7,
pp. 242-243. Lit. 14, 7 figs.

In this third and final part of a series on this topic the author deals with the poisonous species of the chordata, amphibians, reptiles and mammals. He provides a survey of their biology and possible encounters with man.

biology - zoology - vertebrates - Czechoslovakia. 147357.

495. LENKIEWICZ, Z.:
Etologia jako dyscyplina nauk biologicznych
(Ethology as a discipline of the biological sciences)
Biologia w Szkole, 37, 1984, No. 3, pp. 131-135.
Lit. 8.

Ethology is a relatively young scientific discipline of science, it has been developing for about 100 years. The name was coined by Geoffroy Saint-Hilaire in 1849. In 1973 K. Frisch, N. Tinbergen and K. Lorenz, all ethologists, received the Nobel Prize in biology. Ethology works closely with zoopsychology, ecology and zoogeography. The article describes the tasks of general ethology, the collection of ethological information, methods used for the study of animal behaviour, the use of a single animal as a model for understanding the behaviour of other animals, and provides a complete comparative analysis of animal behaviour. The author describes the methodology of comparative analysis in detail, as well as other methods for studying animal behaviour. The article is suitable for general education secondary school students, as well as pupils in basic schools.

biology - zoology - ethology - Poland. 147357.

496. MŁODOWSKA, Z.:
Etologia dziedzina w szkole nieznama (Ethology as an unknown discipline in school)
Biologia w szkole, 37, 1984, No. 3, pp. 163-167.
Lit. 17.

The modernization of biology instruction in schools requires the introduction of new scientific disciplins into the school curriculum. At present also ethology, the science of animal behaviour, should be introduced into school biology courses. The author discusses the status of ethology as a science at present and in the past and stresses its significance for education. Incorrect opinions concerning animal behaviour are still frequently encountered. Ethology is also becoming a part of school Olympiads in biology. The author provides an outline of the basic subject-matter of this discipline and a bibliography for teachers.

biology - zoology - ethology - biology Olympiads - bibliography - Poland. 147357.

497. POKORNÁ, M.:
Transplantace embryí (The transplantation of embryos)
Věda a technika mládeži, 38, 1984, No. 12, pp. 366-367.
3 photos, 1 fig.

It is now possible to transplant a fertilized egg from the sexual organs of a female (the donor) to the sexual organs of another female (the recipient). The purpose of the transplant is to achieve the successful development of the transplanted embryo in the organism of the recipient, up to the delivery of a healthy baby or young animal. In principle transplantations can be done in all mammals and in recent years they have been done in humans, but also in farm animal breeding. The author describes the history and also the technique used in these transplants. The first such transplant was done in rabbits by W. Heap at Cambridge University in Britain.

biology - zoology - mammals - zoo-technology - transplantations - Czechoslovakia. 147357.

498. ŠKODOVÁ, H.:
Neobvyklá sbírka motýlů (An unusual collection of butterflies)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 1, pp. 8-9, 1 photo.

The international Food and Agriculture Organization (FAO) estimates that cereal and flour pests annually take away from people 33 million tons of cereals, which could serve to feed 150 million people. For Czechoslovakia this would represent enough food for two five-year plans. In our silos and flour warehouses there are 900 different species of pests, of this number 100 are found frequently. The author describes pest control with the aid of pheromones (the female´s smell is used to entice males). For this purpose synthetic pheromones are used. A new type of insecticide has been developed on the basis of cooperation with the Research Institute for Food, Pheromones are placed on sticky strips of paper to which males fly or creep. Very positive results have been obtained.

biology - zoology - insects - butterflies - pests - pheromones - Czechoslovakia. 147357.

15.3 Human biology

499. HESSE, P.G.:
Die Zirbeldrüse (Epyphyse) (The pineal body or cranial epiphysis)
Biologie in der Schule, 33, 1984, No. 1, pp. 444-445.

The pineal body or cranial epiphysis is a small reddish-grey conical structure on the dorsal surface of the midbrain which is found in all vertebrates. In man it is surrounded by collagen connective tissue, inside it is formed by a network of glia cells, among which the pineal cells are found. Under changing light intensity the number of sinaptic ribbons changes. These rod shaped cells are found under the cytoplasmatic membrane and they probably participate in the intracellular and intercellular transmission of information. The pineal body blocks the hormones produced by the frontal hemisphere of the pituitary gland which acts upon the gonads. The effective substances produced are melatonine and/or methosytryptophol. The pineal gland is assumed to act as a decelerator of hormones. For instance it was found that in laboratory animals melatonine causes a reduction in gonads in the autumn. The pineal body contains substance which are biological very interesting: ACTH, LH, endorphine and others. Ultraviolet radiation causes a decrease of melatonine. Experiments have also shown that the short-term reversal of horizontal components of the Earth´s magnetism and a magnetic field at night lead to a decrease in melatonine production in the body. In old age the pineal body becomes smaller.

biology - human biology - physiology - central nervous system - brain - GDR. 147359.

15.4 General biology , genetics, macromolecular biology, biochemistry, biophysics and bionics

500. BOONE, C.K.:
Moral Fantasy in Genetic Engineering
The American Biology Teacher, 46, 1984, No. 8,
pp. 449-456. Lit. 8, 1 photo.

The author deals with the ethical problems of genetic engineering and the contraversy about the use of genetic engineering in the future. He describes a resolution signed by a number of scientists and other persons who have asked the US Congress to prohibit further experiments in genetics. The author also describes how the Nazis misused science and the fact that genetic technologies could be misused even today. This article is suitable for use in general biology and genetics courses in secondary school.

biology - human biology - genetics - general biology - genetic engineering - USA. 147363.

501. DIMKOV, R.:
Biotekhnologiyata - vchera, dnes i utre (Biotechnologies - yeasterday, today and tomorrow.)
Biologiya i khimiya, 27, 1984, No. 3, pp. 3-6.

The author defines biotechnologies as the integrated utilization of biochemistry, microbiology and chemical engineering for the technological utilization of microorganisms, as well as cellular and tissue cultures. He includes micro-biological synthesis, as well as genetic and cellular engineering, enzymology engineering, technological biotechnologies and ecological biotechnologies. At present this new field of science deals with the recombination of DNA, with the aim of implementing artificial functional chromosomal microbiological synthesis. Pupils should become acquainted with this new field of science.

biology - biotechnology - general biology - microbiology - genetic engineering - Bulgaria. 147363.

502. GEISSLER, E.:

Erlaubt die Genetik eine Aufweichung der Grenze zwischen B- und C-Waffen ? (Will genetics make it possible to change the distinction between chemical and bacteriological weapons?)

Biologie in der Schule, 33, 1984, No. 1, pp. 41-43.

The development and production of biological and toxic weapons has been prohibited by the so-called B-convention, in operation since 1975. But so far no agreement on chemical weapons has been concluded. There are well founded fears that by methods used in genetic engineering it is possible to develop "biochemical weapons" in the form of genetically programmed bacteria or through chemical synthesis. Some experts are of the opinion that at least some toxic substances are not covered by the prohibition of biological weapons. The author also discusses the problem of whether biochemical substances are covered by the agreement concerning B-weapons (he thinks the answer should be positive) and to what extent synthetic toxins are explicitly prohibited. Because the definition of toxins is not clear the situation is somewhat complicated.

biology - genetics - genetic engineering - biochemistry - weapons - GDR. 147363.

503. LISHENKO, I.D.:
Dostizheniya selektsii i eyo vklad v vipolneniye Prodevolstvennoy programmi SSSR (The achievements of animal selection and their contribution to fulfilling the Food Program of the USSR)
Biologiya v shkole, 58, 1984, No. 6, pp. 7-11.

Selection has an important role to play in improving the quality of agricultural production. The task of agriculture is to breed new strains of crop plants, which are adequate to the needs of industrial technologies in crop production, as well as strains which are resistent against disease and pests, which provide high yields, Also the breeding of farm animals with the required production characteristics is based on selection. The author acquaints readers with some of the successes achieved in this area and their contribution to fulfilling the Food Program of the USSR.

biology - general biology - genetics - selection - breeding - USSR. 147363.

504. SCHELLBORN, M.:
Wesentliche Prinzipien der genetischen Theorie der Evolution in der ersten Hälfte des 20. Jahrhunderts
(The essential principles of a genetic theory of evolution in the first half of the twentieth century)
Biologie in der Schule, 33, 1984, No. 5, pp.194-200.

At the end of the 19th and beginning of the 20th centuries genetics developed as a science. By the middle of the present century its findings have had a profound influence upon various hypotheses and ideas concerning the development of living nature. The author analyses the history of the basic discovery of the principle of heredity, the work of Mendel, H. de Vries who formulated the principle of mutations, the work of T.H. Morgan and his school, as well as the experiments with microorganisms done by Beadle, Tatum and Nurosporov. The principle of natural selection was first developed by Hardy, Weinberg and Chetverikov, genetic shift was developed by Wright in 1931. J.S.B. Haldane developed a mathematical theory of natural and artificial selection. Boveri, Johanssen, Morgan and Dobshansky developed the relationship between the genotype and the phenotype. In conclusion the author describes the development of phenogenetics (Driesch, Houx, Spemann, Haecker etc.). An essential characteristic of all hypotheses formulated in the first half of the 20th century, is that they all assumed the key role of proteins in the proces of heredity.

biology - general biology - genetics - history - evolution - GDR. 147363.

15.4.1 Ecology

505. PAUCKE, H.:
Das ökologische Bewusstsein ist erwacht - was heisst es ? (An ecological awareness has been aroused - what does it mean ?)
Biologie in der Schule, 33, 1984, No. 12, pp. 483-389.

Towards the end of the 20th centry mankind is facing global problems of a social, economic, demographic and also ecological nature. Ecological problems are becoming especially pressing, but the resources available for their solution are insufficient, among others because annually 750 billion dollars are spent on armaments. Nevertheless, the ecological awareness of mankind is increasing and this is apparent in four different trends: 1) More is being learnt about ecological problems and in a more speedy manner; 2) There is a better understanding of ecological phenomena and processes and their connection with anthropogenic processes; 3) There is an increasing awareness of the responsibility of mankind for the rational utilization and conservation of nature; 4) Behaviour towards the environment is changing. As far as further tasks in this area are concerned, the author recommends stress on the early recognition of ecological problems, a correct understanding of environmental problems, the development of a responsible attitude towards nature and education towards a correct attitude towards nature and correct behaviour outdoors.

biology - ecology - nature conservation - environmental conservation - GDR. 147362

15.5 Medical sciences and health-care

506. HORNÍK, F.:
Interferony - nový lék proti rakovině ? (Are interferons a new drug against cancer ?)
Přírodní vědy ve škole, 35, 1983-1984, No. 8,
pp. 291-292.

Interferons have antiviral properties and they also suppress the growth of some cancers, so it seems they will become a drug against cancer. The cells of all vertebrates are capable of producing interferons and the substance is not specific for various viruses, but rather for various specie; it is effective against a large number of viruses, but only in the cells of the specie in which it was produced. The author provides interesting information about its properties and about how scientific research in this area is continuing.

biology - medicine - cancer - viruses - Czechoslovakia. 147346.

15.6 Agriculture and agro-technology

507. NEVRTAL, J.:
Integrovaná ochrana rostlin (The integrated protection of plants)
Přírodní vědy ve škole, 35, 1983-1984, No. 9, pp.328-329.
Lit. 7.

In crop production modern science makes it possible to solve some of the negative problems which are the outcome of using large quantities of chemicals in agriculture. In the seventh five-year plan, chemicals in agriculture are becoming an important factor and the integrated protection of plants is stressed. The main principle of integrated plant protection is to take ecological factors into consideration in a comprehensive manner and to maintain in crops, as well as in other types of biocoenoses, biological equilibrium at all times. This subject-matter is well suited for teaching both in basic and secondary schools.

biology - agriculture - crop production - protection of plants - ecology - Czechoslovakia. 148979

508. PAUCKE, H.:
Ökologische Probleme und ihre Bewältigung im Sozialismus
(Ecological problems and overcoming them under socialism)
Biologie in der Schule, 33, 1984, No. 2/3, pp. 56-60.

The author first discusses problems concerning the conservation of the forests and waters and then analyses the causes of the damage done from an ecological point of view; in the author's opinion they are caused by socio-economic factors. One of the strategies for nature conservation is more intensive agricultural production using modern technologies (such as wasteless technologies and technologies based on a closed cycle) which the author describes in some detail. He considers the integration of ecological aspects into the process of economic reproduction to be an essential characteristic of socialism.

biology - nature conservation - ecology - agriculture - GDR. 148979.

15.7 Agriculture and zootechnology

509. Chovy v kostce (Breeding in a nutshell)
ABC mladých techniků a přírodovědců, 28, 1983-1984, No. 18, pp. 9-16, 1 appendix, 12 photos, 5 figs.

The author provides basic facts about the breeding of farm animals including geese, duck, sheep, goats, turkeys, rabbits, chickens and others.

The article provides information about necessary facilities, quantities and kinds of feed, the reproduction of these species and breeding procedures. This article can be used for teaching in the 6th grade zoology course in basic school.

biology - agriculture - animal husbandry - farm animals - Czechoslovakia. 147369.

15.7.1 Microbiology

510. HORNÍK, F.:
Mikroorganismy a příprava proteinů (Microorganisms and the production of proteins)
Přírodní vědy ve škole, 35, 1983-1984, No. 3, pp.89-90.
Lit. 2, 1 tab.

According to estimates the population of the world has a protein deficit equal to 25 million tons annually. This deficit exists above all in the developing countries. Estimates also assume that by the year 2000 this deficit will already be equal to 100 million tons. The solution is to intensify the production of food on the basis of new technologies. Proteins can also be obtained from non-traditional sources from which high protein animal fodder can be made, for instance from sea weeds, yeasts, blue-green algae, bacteria and also from agricultural waste.

microbiology - proteins - sea weeds - yeast - petroleum - agriculture - Czechoslovakia. 147371.

15.8 Outstanding scientists, anniversaries, deaths, outstanding biology educators

511. BECKER, H-J.:
Johann Gregor Mendel (1822-1884) und die Folgen
(Mendel and the consequences)
Praxis der Naturwissenschaften - Biologie, 33, 1984, No. 9, pp. 257-261. Lit. 16, 1 fig.

The author describes the situation in biology one hundred years ago and the specific contribution which Gregory Mendel made to founding the science of genetics. 1965 was celebrated as Mendel Year, which commemorated the one hundreth anniversary of two lectures Gregory Mendel held in Brno, which he called "Experiments with Hybrid Plants". The text of the lecture was published that same year. 1984 commemorates the one hundreth anniversary of Mendel´s death in 1884. The author also discusses the importance of Mendel´s ideas for the future development of biology as a science. Mendel continues to be a significant scientist and the foundations of Mendelism should be included into school curriculums.

biology - genetics - Gregory Mendel - anniversary - death - FRG. 147365

512. GAJSINOVICH, A.J.:
100 let fagotsitarnoy teorii I.I. Mechnikova
(One hundred years of Mechnikov´s phagocyte theory)
Biologiya v shkole, 58, 1984, No. 2, pp. 20-26.
Lit. 14, 1 photo.

One hundred years ago the Russian scientist Mechnikov formulated the theory of phagocytes, which explains the mechanism of the resistence of an organism against infection. Mechnikov was able to prove that phagocytes have a decisive role to play in combating infection since they are the cause of immunity. The author describes the work of Mechnikov and also describes new work done in this area, specifically in immunology and genetics.

biology - human biology - medicine - phagocytes - anniversary - USSR. 147365.

513. Ob oznakomlenii uchashchikhsya obshcheobrazovatelnikh shkol s materialami dekabrskogo (1983) plenuma CK KPSS

(Acquainting pupils in general education schools with the documents of the December 1983 plenary session of the Central Committee of the Communist Party of the Soviet Union)
Biologiya v shkole, 58, 1984, No. 2, pp. 7-9.

The Ministry of Education of the USSR passed on to the ministries of union republics a methodological letter with instructions on how to acquaint pupils in general education school with the documents of the December 1983 plenary session of the Central Committee of the Communist Party of the Soviet Union, which concern the draft of the state plan of economic and social development of the USSR and the state budget for the year 1984. Schools are asked to take measures for implementing the resolution of the December plenary session. The Ministry of Education recommends holding meetings with pupils where the following topics will be explained: The plans of the Party are the plans of the nation; The USSR in the struggle for peace; Construction and peace are the great aims of the

Communist Party and the Soviet people; The state plan of economic and social development for 1984.

biology - Ministry of Education - general education schools - Communist Party - USSR. 147365.

16. Scientific articles on nature conservation and environmental control

514. BYBEE, R. - HIBBS, M. - JOHNSON, E.:
The Acid Rain Debate
The Science Teacher, 51, 1984, No. 4, pp. 50-55, 2 figs.

The author describes a game which concerns acid rain and its consequences for the landscape and the environment. In the game students take upon themselves different roles, such as those of industrialists, ecologists and government officials. In the debate, representatives of various groups, and also these groups from the USA and from Canada, present their point of view. This is a very good educational game where students become acquainted with different points of view. The representative of each group is allowed 10 minutes to present his or her case.

biology - ecology - environmental control - didactical game - USA. 149663.

515. **HARTMAN, Z.:**
Vliv ropných látek na vegetaci (The influence of petroleum products upon vegetation)
Památky a příroda, 9, 1984, No. 3, pp. 166-170.
Lit. 10, 3 photos.

The author discusses the conservation of underground water in the part of southern Slovakia called the "Island of Rye" (Žitný ostrov), which borders on the Hungarian republic and is one of the most fertile cereal producing areas in Czechoslovakia. This conservation is especially important because of the pollution caused by the petroleum refinery and petrochemical plant Slovnaft located in Bratislava. Experiments carried out to study the effect of petroleum products upon vegetation have shown that there are long-term effects which concern the specie composition of vegetation, its density and other influences. The author describes the methodology used in these experiments and the findings arrived at.

biology - ecology - environmental control - nature conservation - vegetation - pollution - Czechoslovakia. 147363.

17. Scientific articles on technology and economics in relation to biology and biotechnologies

516. SCHMAUDER, H.P.:
Biotechnologie - eine neue interdisziplinäre Wissenschaft (Biotechnology - a new interdisciplinary science)
Biologie in der Schule, 33, 1984, No. 5, pp. 201-203.
1 tab.

Some biotechnological procedures, such as the making of wines or cheese, have been used since time immemorial, but only in recent years has their theoretical clarification taken place. Radical developments in this area began only when biological and technical sciences began to cooperate. For the future, especially the following fields of biotechnologies are assumed to be very promising: 1) Microbiological processes such as the production of antibiotics, the production of bio-gases, etc.; 2) Processes with more complex organisms or the cultivation of their organs or isolated cells, such as the production of biomass; 3) Gene technologies which make it possible to change specific hereditary properties of organisms; 4) Biochemical processes without the direct use of living cells, such as for instance synthesis by immobilized enzymes.

biology - biotechnology - microbiology - genetic engineering - GDR. 147371.

DIDACTICS OF BIOLOGY - a selected bibliography for 1984

Published by the Central Library - Sectional Information
Centre of the Pedagogical Faculty - Charles University

Editor: RNDr.František Horník
Responsible editor: PhDr.Pavla Lipertová
Printed by: Tiskařské závody, Čelákovice
Printing: 100
Number of pages: 351
Year of Publication: 1987
ÚVTEI 760 47/E
RUK 60-200